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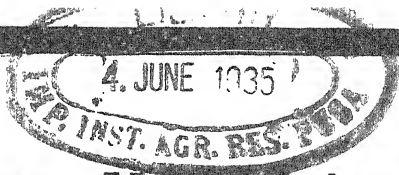
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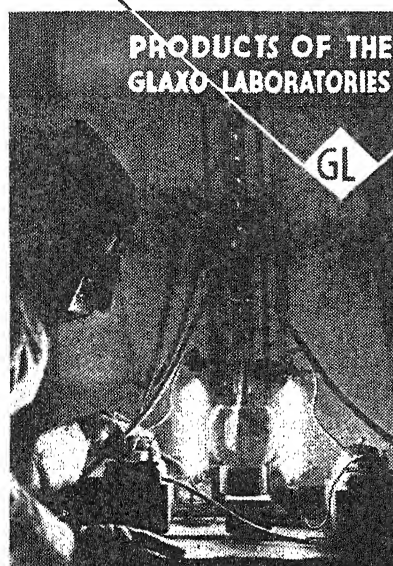
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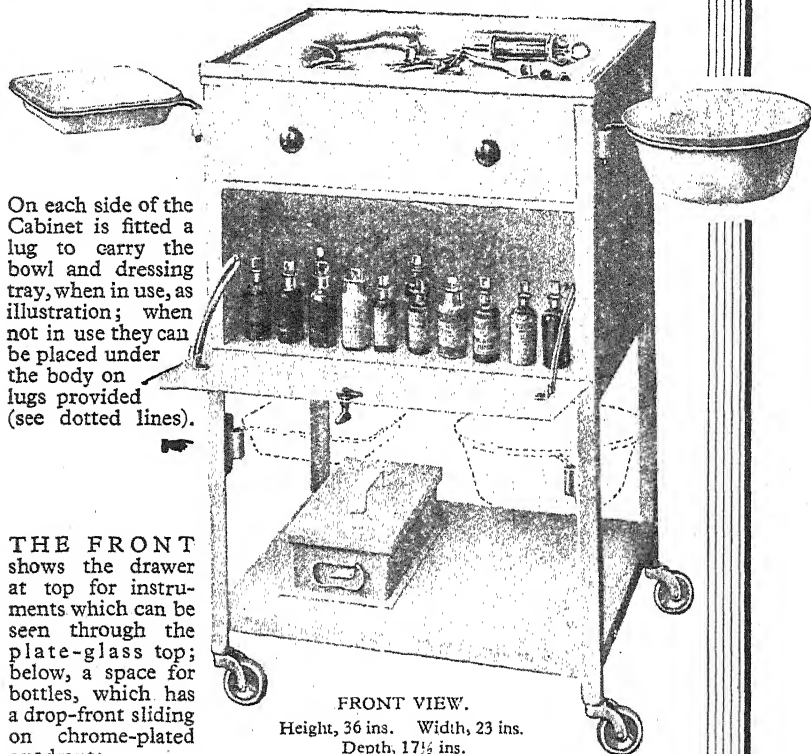
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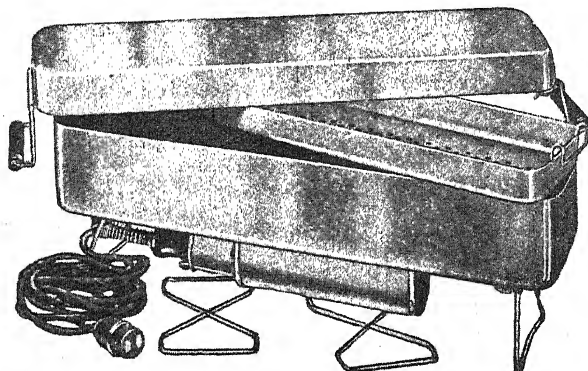
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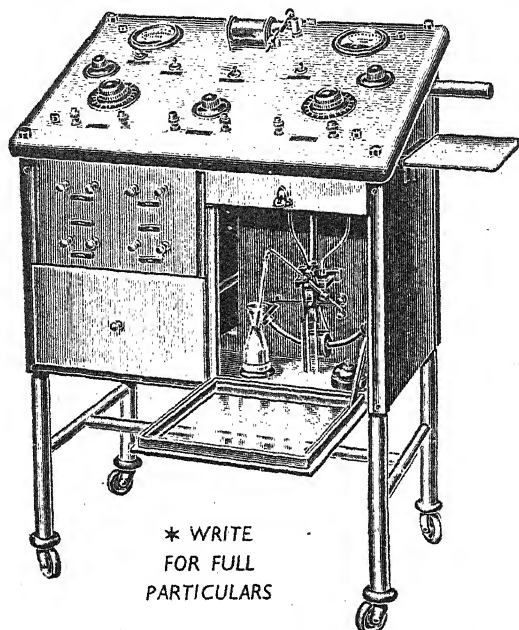
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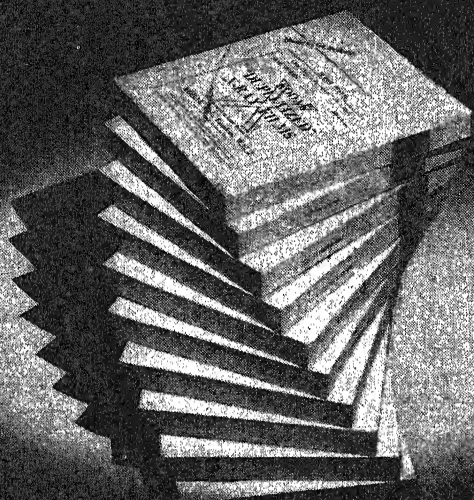
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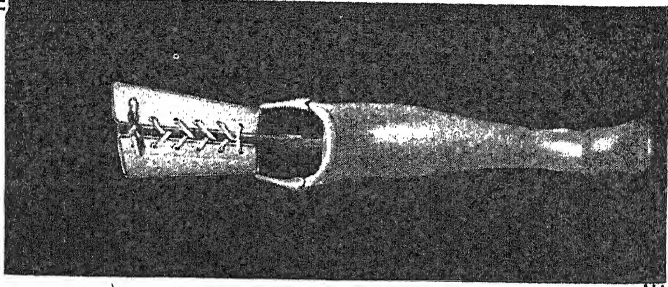
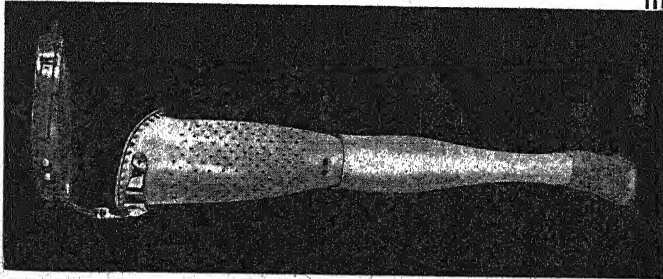
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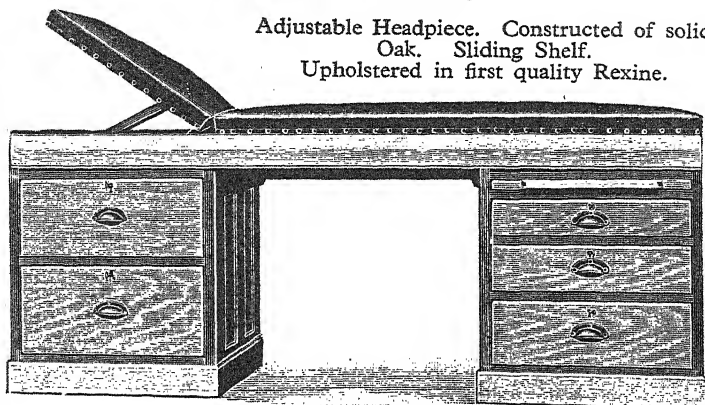
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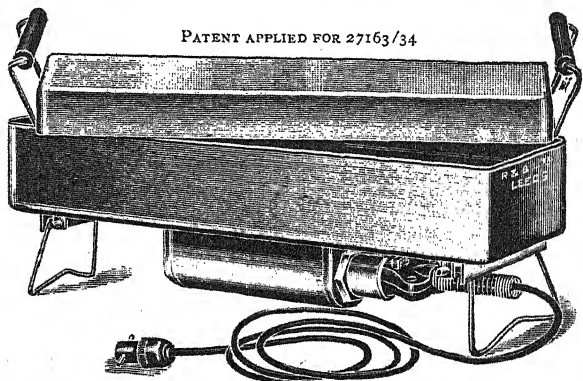
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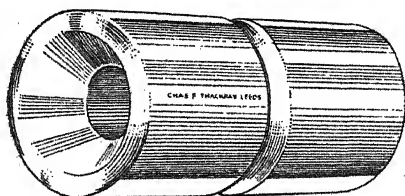
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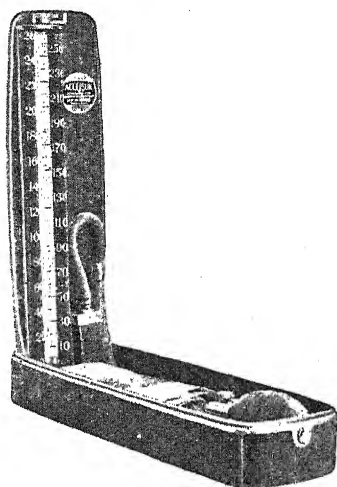
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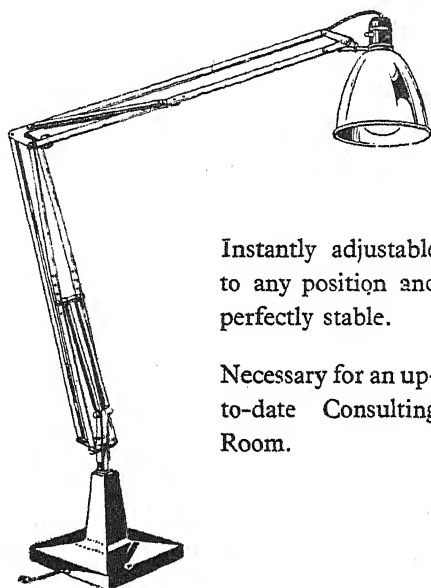
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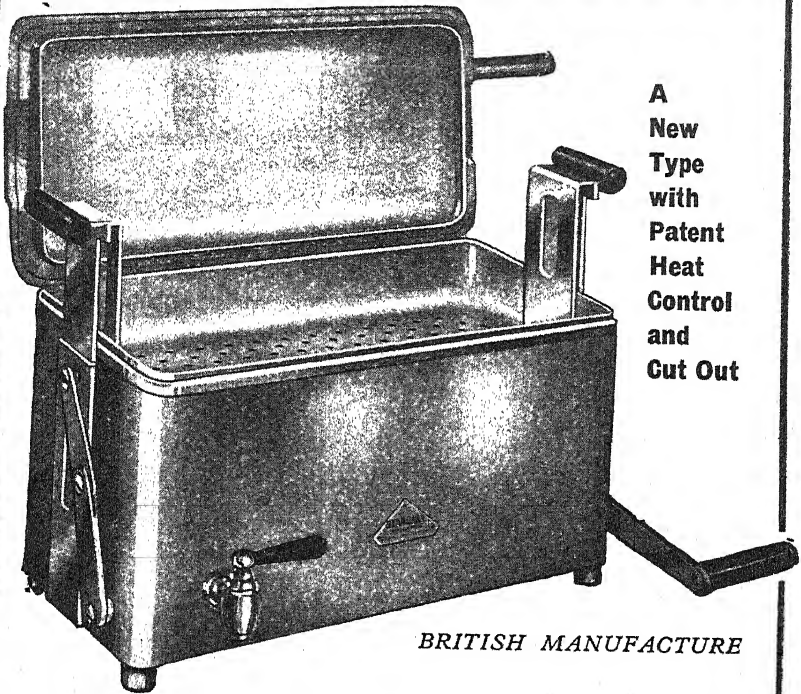
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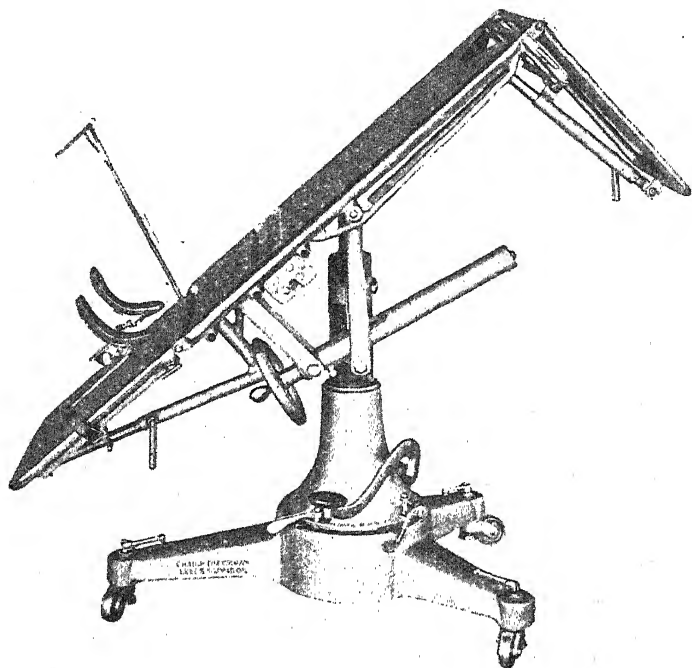
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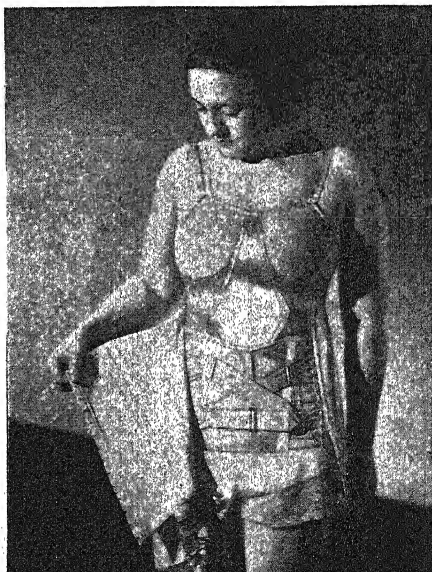
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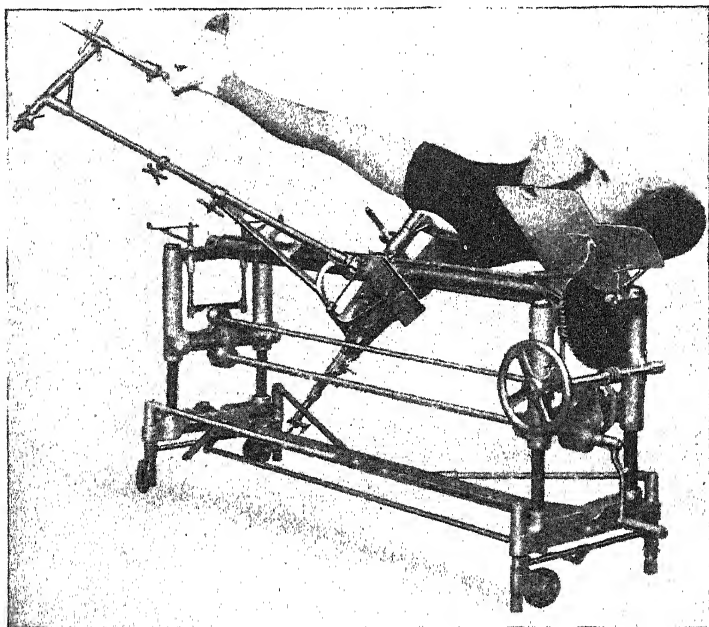
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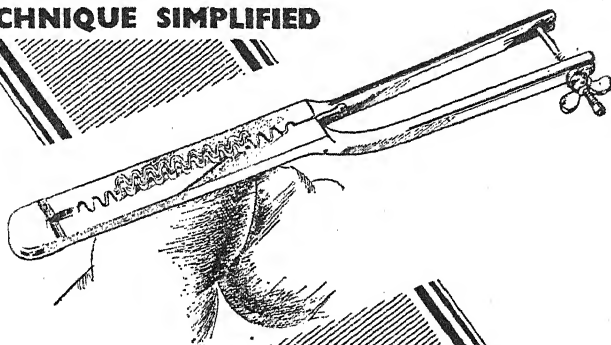


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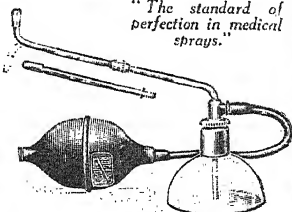
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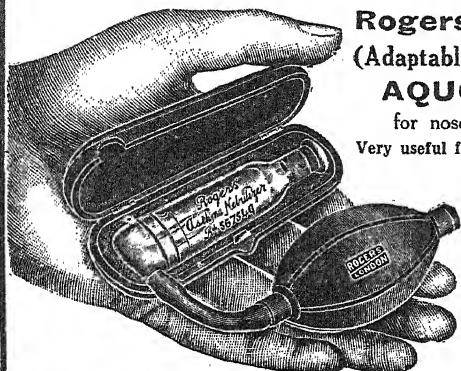
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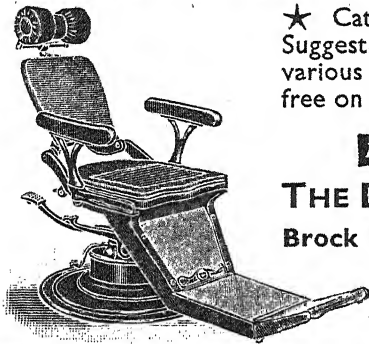
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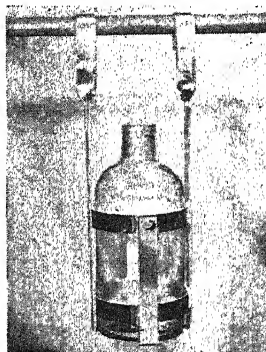
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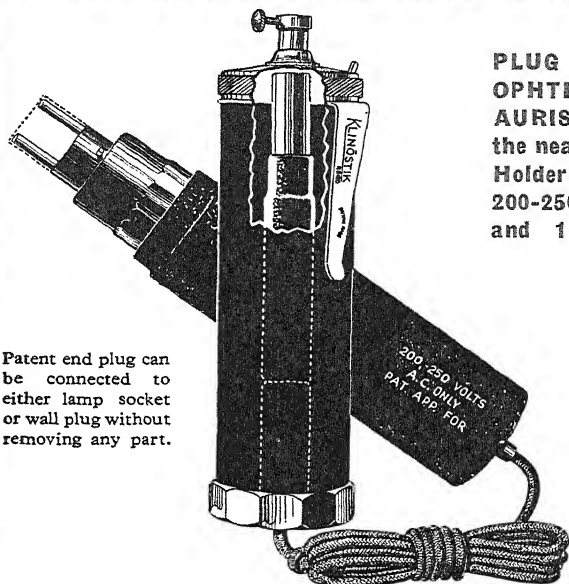
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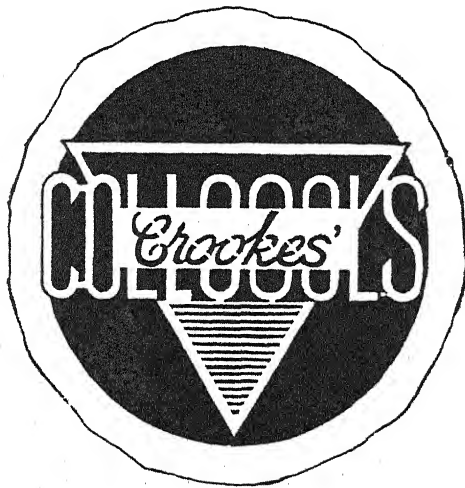
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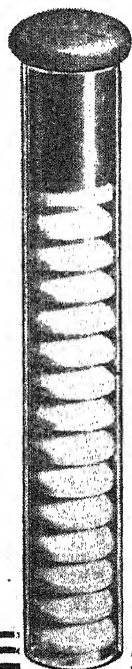
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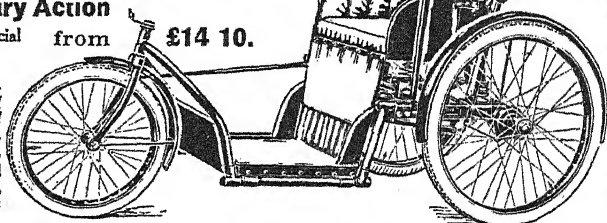
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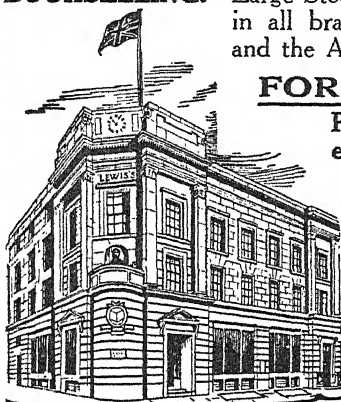
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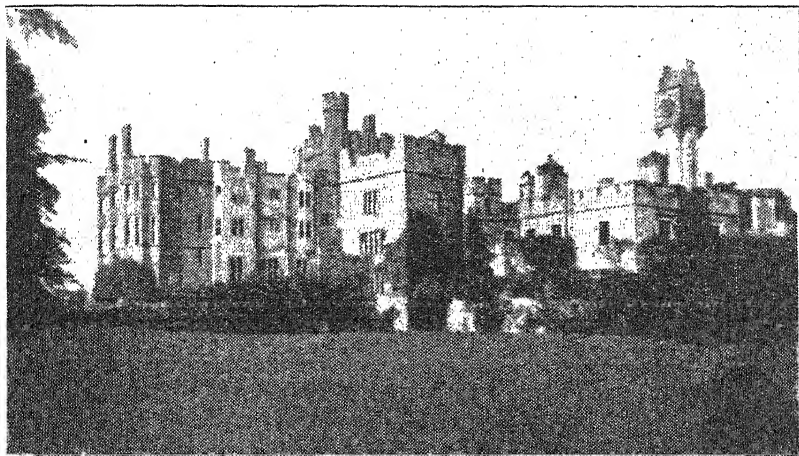
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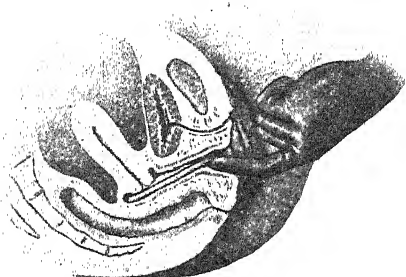
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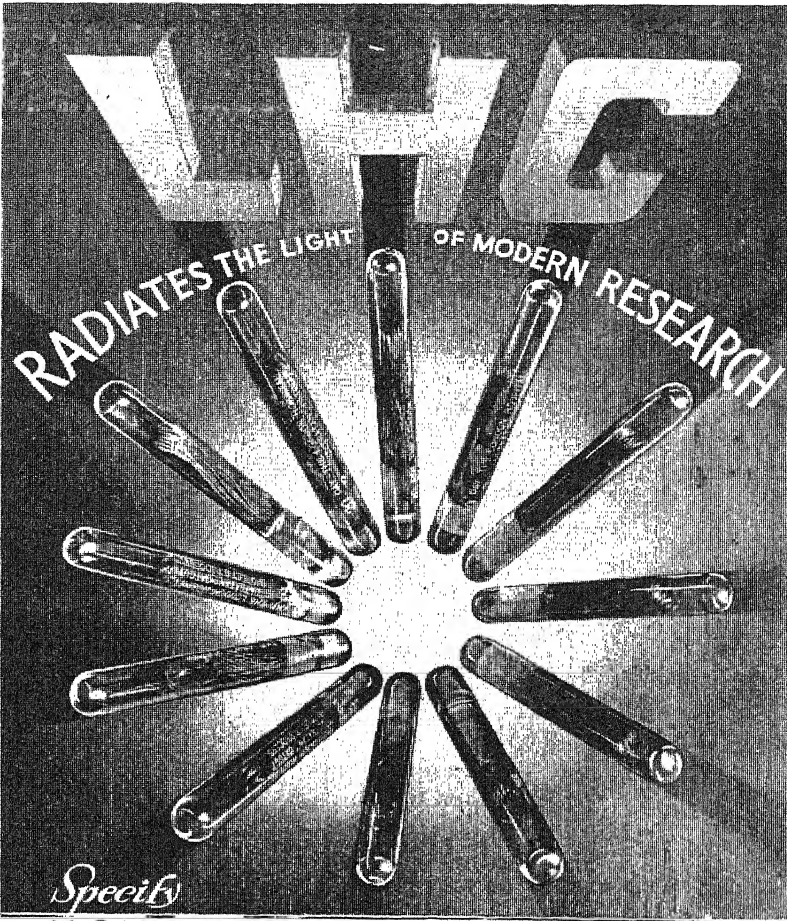
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THE MEDICAL ANNUAL, 1935

*A Review of the Year's Work in the
Treatment of Disease*

INTRODUCTION

BY THE EDITORS

THE MEDICAL ANNUAL chronicles year by year the advances in medical science. During the past twelve months there has been much interesting work to be recorded. As in the past attention has been paid to methods of treatment which can be applied at once to general medical practice, while in other directions, such as in clinical pathology, progress has been summarized. The Introduction serves as an indication of the matters of more immediate interest, but does not exclude the value of sections and subjects which are not referred to. In many cases the importance of an advance is not recognized until it has developed over several years into a form applicable in practice.

It has been the custom of the Publishers every ten years to issue an Index of the subjects referred to in the MEDICAL ANNUALS for that period. The development of a new discovery or of a new view in medicine can thus be rapidly referred to and the principal articles in the literature ascertained. The last decennial index was published in 1925, covering the years 1916-1924. Another decade has passed, and the Fifth Decennial Index, for the years 1925-1934, is now ready. A new feature has been introduced into the present Ten-year Index which it is hoped will be specially appreciated. The Editors of each section have contributed a review of the principal discoveries and advances in each branch of medical science, with references which enable the reader to study the more important subjects in detail. It constitutes as a whole a Ten-Years' Survey of Medicine in all its aspects.

The sudden and unexpected death of Dr. Vincent Coates came as a shock to the whole medical profession as well as to the large circle of his personal friends. He brought to his medical work an attractive personality, an intellect of high order, and a bodily activity which in his younger years had made him a famous athlete. His associations with Bath naturally turned his bent to rheumatic disorders, in which he had become an authority of world-wide reputation. He took exceptional interest in his yearly review of the subject for the MEDICAL ANNUAL, and spent much trouble in collecting literature both for the present volume and for the Ten-Years' Survey in the Decennial Index. By the courtesy

of Mrs. Coates, this material has been handed to Dr. Ivor Davies, who very kindly undertook the editorship of this section at short notice, and it has been made use of by him in his reviews.

MEDICINE.

LEGISLATION AND LEGAL DECISIONS.—The legal obligations of a medical practitioner are extremely numerous and complicated. It has been stated that there are more than forty duties which he is compelled to perform under various Acts of Parliament without remuneration. Some are trivial, but many enter into his daily life, and the law is not always quite clearly stated. The review of recent legal decisions and enactments which concern the medical profession is of value to all practitioners. It also deals with a series of interesting problems which have a human as well as a professional and legal interest. We are sure that the article will be welcomed.

INDUSTRIAL MEDICINE.—Industry and medicine now touch at innumerable points. The industrial revolution which resulted from the change over to machinery at the beginning of the nineteenth century must have involved numerous important medical problems. Unfortunately at that time the knowledge of and interest in such questions was very limited. The law took little notice of the workers, and so far as one can gather employers showed little concern for the health of their employees. Matters are now very different. Medical knowledge has advanced and numerous important acts have been passed. Medicine and legislation have advanced hand in hand. Employers now recognize that a healthy body, and one may add a reasonably contented mind, is more efficient than a sick frame. Health is a matter of interest to all parties. A special article on Medicine in an Industrial State, is contributed by Dr. Leonard Lockhart, and we are sure will be read with interest.

PSYCHOSES.—It is now recognized that neuroses in children are of the greatest importance, as the course of future adult life may be determined by them. The medical profession is now consulted not infrequently about them, and parents expect their doctors to have a general knowledge of recent views. Not infrequently the parents possess some partial ill-digested knowledge of psychology derived from conversations with friends and from reading popular manuals. Various articles are reviewed dealing with these matters and with nervous disorders as they are met with in general practice.

The importance of toxæmia as a causative factor in the psychoses is still undetermined. The review calls attention to the wide difference in the opinions of different investigators and the need for caution in the interpretation of observations.

A more rational attitude is now being adopted towards occupational neuroses. Formerly they were dismissed summarily as 'functional'. Now they are recognized as worthy of study, though treatment still remains unsatisfactory. Some interesting articles are reviewed.

The interest of suicide to the medical profession is usually from the medico-legal aspects. It is, however, important to recognize whether a certain individual is likely to attempt it, and even the best authorities make mistakes, which of necessity often receive publicity in the Coroner's Court. Several articles on the subject have appeared recently and are fully reviewed.

INFECTIOUS DISEASES.—The question whether or not cats could disseminate diphtheria was hotly debated in the past. Evidence gradually accumulated which exonerated them from any part in its spread. Recent studies with modern methods may be said to have established the fact that they are not liable to the disease and have no influence greater than any inanimate object which may be contaminated with bacilli.

Epidemic encephalitis has become a rare disease in recent years though never quite absent. But in 1933 an extensive epidemic occurred in St. Louis. This differed from the classical type in the rarity of eye signs, and in the rapid, complete, and permanent recovery which followed. The mortality rate was 18 per cent.

Epidemic jaundice is still attracting attention. The presence of *Leptospira icterohæmorrhagiæ* has been proved in various cases and in many sewer rats. But large epidemics of jaundice occur in which no organism can be found. The mortality is negligible but the amount of sickness is considerable.

Epidemic pleurodynia has attracted attention owing to an outbreak in Lancashire and Yorkshire. The disease has also been described under the titles of 'epidemic pleurisy' and 'Bornholm disease', and has been known in the past colloquially as 'devil's grip'. It is important to be familiar with the existence of this curious condition, as the sudden onset and severity of the pain suggest some serious catastrophe.

ELECTRICAL INJURIES.—Electricity enters into the daily life of every member of the community, but only a fraction of the general public has the slightest knowledge of the subject. Electrical injuries are now by no means uncommon. A full review of the subject and the methods of treatment is given.

MIGRAINE.—Migraine is a condition which particularly attacks those of the higher intellectual orders. Members of the learned professions are frequent sufferers. There is no doubt that many different factors may precipitate attacks. Thus in a certain individual the attacks may be solely concerned with errors of fat metabolism, or occasionally the existence of chronic duodenal ileus. But the nervous and psychological factors are of great importance, and the full description of these by the reviewer will be welcomed.

CARCINOMA OF THE LUNG.—The frequency of carcinoma of the lung continues to excite interest and contradictory statistics. Middle-aged clinicians appear to be almost unanimously of opinion that there is a marked increase. The statisticians are less certain. There can be no doubt that it is diagnosed more frequently during life, but as these cases

practically always die directly from the cause this does not explain the greater frequency at autopsy. Several investigations are reviewed this year.

SERUM TREATMENT OF PNEUMONIA.—The serum treatment of lobar pneumonia is of great importance. It was early recognized that the crude statistics pointed to some definite effect. Investigations now aim at establishing in which type and in what circumstances the beneficial action occurs. Pneumonia is a very difficult disease in which to decide the value of any remedy, but it is clear that Type I is benefited and doubtful if the others are affected. The cost of the serum still remains very high. Several important articles are summarized by the reviewer.

THYROID HEART.—Knowledge of the relation of the thyroid gland to the condition of the heart has advanced rapidly in recent years. Thyroidectomy in cases of hyperthyroidism produces so marked and beneficial an effect on the heart that the operation has now been applied to cases of congestive heart failure and angina. Cases necessarily have to be carefully selected, but the results so far are distinctly promising. Several articles on the subject are reviewed in the section on Thyroidectomy in Heart Disease.

THE BARBITURATES.—Barbiturate poisoning and addiction has recently attracted much attention in many countries. Barbiturate poisoning as a method of suicide has greatly increased in recent years. Addiction involves the question of the wisdom of ordering barbiturates for such conditions as insomnia, and experts differ greatly in their views. The discussions which have taken place are reviewed from several different aspects, among others in the sections on Poisoning and on Pharmacology.

SLIMMING.—With the modern craze amongst many women of combining a minimum of adipose deposit with a minimum of clothing, therapeutic means of removing any superfluous fat are eagerly resorted to. The profession is aware of the invariable danger of doing so except under strict observation, but the public was surprised and shocked by a death from an overdose of dinitrophenol. The subject is reviewed in the section on Poisoning.

TROPICAL DISEASES.—Malaria may be accepted as the most widespread disease in the world. Many problems remain to be solved and numerous researches are referred to by the reviewer. Atebrin is settling into an established place in treatment, but its cost is a bar to general use. It is noteworthy that the Malaria Commission of the Health Organization of the League of Nations has decided that no standard treatment can be advised as the types and degrees of severity of malaria vary so widely in different areas.

Yellow fever wiped out many an expedition to the tropics in the days of our ancestors. Now it is again to the fore with a new problem in modern dress. The serum test at the Rockefeller Foundation has proved the existence of an infected belt in Africa from Nigeria to the South Sudan.

Hitherto progress northwards has been barred by the Sahara and its subsidiary deserts, but an aeroplane might convey an infectious case to districts such as Egypt and India where *Aedes argenteus* mosquitoes swarm. Research on the disease is therefore being actively pursued.

ENDOCRINOLOGY. — Knowledge of endocrine glands has advanced rapidly in recent years and has been stimulated by the discoveries in the region of sex hormones and of Cushing's syndrome. Modern thought is well summarized in the series of reviews on this subject.

SURGERY.

GENERAL SURGERY. — When it is desired to dilate the peripheral circulation, resection of a short length of an artery is better than ligation in cases of aneurysm, as it severs the vasoconstrictor nerves. A condition which though rare ought to be remembered, because the only hope lies in immediate operation, is arterial embolism, usually derived from a diseased heart, the embolus lodging in one of the main vessels of the leg; the treatment may be embolectomy or arteriectomy. For septic hands, a writer advises a thick dressing of vaseline left untouched for a week instead of the usual fomentations. For septicaemia, an injection of 20 c.c. of human serum into the buttock is recommended. Warning is given that repeated sterilization of solutions of dextrose may render it toxic by caramelization; a yellow coloration indicates danger. Complete thyroidectomy has lately been practised for certain cases of chronic heart failure in order to reduce metabolism. Radiation instead of removal of the parathyroid glands may give good results in cases of generalized osteitis fibrosa. In the treatment of varicose veins the best results are often obtained by a combination of operation and injections.

ABDOMINAL SURGERY. — Some very disquieting figures have been published as to the frequency with which abdominal incisions burst open in the post-operative period. On the other hand, a French surgeon urges us to get our patients out of bed within a few days of the operation! Attention is drawn to the fact that appendicitis in patients past forty often begins in a very atypical fashion and the diagnosis may easily be missed. Paralytic ileus and post-operative gas-pains may be combated by a pituitary derivative called pitressin given in repeated doses. The value of localized, uneven abdominal distension as an early sign of post-operative intestinal obstruction is commented on; the fact that flatus and small liquid stools may still be passed should not deter the surgeon from re-opening the abdomen. Some remarkable new work has been done on the action of morphia on the alimentary canal; apparently it stimulates rather than paralyzes intestinal muscle. One should not be in a great hurry to operate for subphrenic infections, as many of them clear up without going on to abscess.

CHEST SURGERY. — A number of articles demonstrate that lobectomy is now quite a practicable and suitable treatment for certain cases of bronchiectasis. A whole lung has been removed successfully on at least

three occasions for malignant disease. Quite good results have been obtained in patients with pulmonary tuberculosis of both lungs by bilateral apical thoracoplasty. Tuberculous empyema is best treated by air-replacement and injection of gentian violet ; if this fails, drainage and thoracoplasty are necessary.

GENITO-URINARY SURGERY.—The use of the electro-surgical scalpel much diminishes hæmorrhage from splitting the kidney in nephrolithotomy. Severe acute pyelitis can often be controlled by an intravenous injection of hexamine. Cases of Addison's disease have been greatly benefited by transplantation of the suprarenal gland. A number of patients with painful bladder spasm have been relieved by dividing the presacral nerve. A method of treating tuberculous cystitis by injections of methylene blue and liquid paraffin is described. A technique, called extraperitonealization, is described for resecting a carcinoma from the base of the bladder, which greatly facilitates the operation. Total cystectomy is a much better treatment than is generally supposed. Injection of a hydrocele with quinine-urea gives very satisfactory results, though at first it looks like a failure. An operation that is gaining favour is incision of the epididymis to relieve pain in gonococcal epididymitis. Vasectomy to sterilize the husband is a much smaller operation than salpingectomy to sterilize the wife. A low death-rate and shortened convalescence are reported by an Australian surgeon who uses a special technique for prostatectomy and closes the bladder.

DISEASES OF BONES AND JOINTS.—The special attention of the surgeon and general practitioner is directed to the long article on the Vienna treatment of fractures : the saving of hospital beds, reduction in time of convalescence, and improvement of end-results are truly remarkable. An account is given of a painful condition of post-traumatic osteoporosis (Sudeck's disease) ; the treatment is absolute fixation. An operation to prevent recurrent dislocation of the jaw is described ; and another to ankylose a tuberculous shoulder. The Smith-Petersen nail is now well established as the best treatment for a fracture of the neck of the femur ; a method is described of placing it correctly.

SURGERY OF THE CENTRAL NERVOUS SYSTEM.—Acute abscess of the brain is not a surgical proposition, until encapsulation occurs, when it should be drained ; the chronic thick-walled abscess is best excised. Ventriculography as a means of diagnosing cerebral tumours is now supplemented by two other X-ray methods, encephalography (lumbar puncture with air replacement) and arteriography (injecting thorotrast into the carotid artery). Cerebral surgery is becoming more and more daring ; at least four patients have survived removal of one whole cerebral hemisphere for glioma, and an operation to obliterate an aneurysm of the circle of Willis has been successful. A study of end-results shows a fair number of patients who have survived removal of a cerebral tumour alive and well after eight years ; growths of the posterior fossa, and pituitary tumours, give the best end-results.

RECTAL SURGERY.—Complete rectal prolapse is a difficult condition to treat satisfactorily; an operation to resect the bowel wall from below is described. Tuberculous fistula is not such an intractable disease as is usually believed; it can generally be got to heal after operation. Rectal incontinence can be cured by a careful operation to repair the anal sphincter. Anal epithelioma responds quite well to radon, which is better in this situation than radium needles.

SURGERY OF CHILDHOOD.—Excellent results, as far as speech is concerned, are reported in a follow-up of the operation for cleft palate described some years ago under the name of pharyngoplasty. A discussion is offered as to the best time for operating on spina bifida.

DISEASES OF THE EYE.—Instillation of antigonococcic serum into the conjunctival sac gives good results in gonorrhœal conjunctivitis. A description is offered of corneal contact glasses, their uses, and how they are to be fitted; they are valuable as a protection for the cornea in cases of keratitis, or after operations, and they may be used instead of spectacles in cases of extreme astigmatism or for conical cornea. Unfortunately, they are expensive, and some patients find them too irritating. Of the new methods of treatment of retinal detachment, diathermy appears to be the easiest and the most successful.

DISEASES OF THE EAR, NOSE, AND THROAT.—Infective cavernous sinus thrombosis is usually regarded as a death-warrant, but a recovery is reported after occlusion of the sinus by electro-coagulation. An analysis of cases diagnosed as 'nerve-deafness' shows that a number of different lesions have been confused under a common title, and not all are as hopeless as the text-books would lead us to suppose. The great importance of recognizing that hoarseness in an adult may be due to cancer, and that very early cancer is very curable, is emphasized. For advanced cases, large doses of X-ray therapy offer some hope of a three-year cure. A method of applying very large doses of hard X rays for carcinoma of the œsophagus has been worked out, and the results are probably the best yet obtained in the treatment of that unpromising disease, though in a few cases surgical removal has been very successful. The laity, and to some extent the medical profession, have been somewhat scandalized lately to discover that boys and girls in the better-class schools more often have their tonsils out than not, and discussion has arisen as to whether this large-scale surgery is really in the public interest. That the tonsils are large, and show whitish débris in the crypts, is certainly no reason for removal, and tonsillectomy is no protection against colds, otitis, rheumatism, or the infective fevers.

VENEREAL DISEASES.—A successful scheme for the treatment of gonorrhœa in women by means of mercurochrome is described. Evidence is accumulating as to the value of the combination of bismuth therapy with the arsenical preparations in the routine treatment of syphilis. Inoculation with malaria continues to give good results in the treatment of neurosyphilis and interstitial keratitis.

OBSTETRICS AND GYNÆCOLOGY.—A review of the analgesics available in midwifery cases sums up in favour of the potassium bromide-chloral hydrate mixture or the morphine (or opoidine)-magnesium sulphate combination for the first stage of labour; gas oxygen for the second stage; and chloroform for the birth of the head. A fall of blood-sugar predisposes to shock, and glucose or barley-sugar ought to be administered. For uterine atony, the intravenous injection of pituitary extract, or injection into the uterine wall of pitocin, is recommended. The first danger-signal of oncoming eclampsia is a rise of arterial pressure; the second to appear is albuminuria, but it may be two months later. In another article the modern conception of vaginal leucorrhœa is explained; general treatment, or irradiation of the ovaries, is more likely to prove successful than local.

ANÆSTHETICS.—Evipan is now being used on a very large scale in many countries, and although a few casualties have been reported it seems to be reasonably safe. It is not likely, however, to displace nitrous oxide gas, because there is a liability to excitement and restlessness for some hours after administration. The best antidotes for an overdose are coramine and strychnine. An attempt to make a fair comparison between spinal and general anæsthesia seems to show that there is not much difference in the risks.

CANCER.—The International Research on the subject of cancer brings to light some interesting facts. The highest crude death-rate is in Switzerland and Holland, England comes second, and Japan has the lowest rate. For some unexplained reason cancer of the breast is relatively common in England and cancer of the stomach in Bavaria. The statistics of the National Radium Commission are quite encouraging; they show that about 40 per cent of patients with cancer of the cervix and cancer of the breast are alive and well after three years, and 20 per cent of cases of cancer of the tongue. The originator of the selenide treatment claims that 20 per cent cases of inoperable cancer are apparently cured.

RADIOLOGY.—It is pointed out that a plain skiagram taken with a portable apparatus without moving the patient from his bed may demonstrate an obstruction of the bowel in post-operative cases hours or days before it can be recognized by clinical symptoms. In doubtful cases of perforated gastric ulcer a demonstration of free gas in the peritonæum by means of X rays may give valuable information. Six-hour-retention of barium in the stomach is sometimes due to quite remote causes, such as growths of the cerebellum, or myxœdema. A skiagram is of first-class importance in the diagnosis of silicosis in mining districts, but the interpretation may be difficult.

Altogether, looking back on the published work of this and preceding years, one derives the impression that the progress of medical knowledge is speeding up, and much of the new information is of first-class importance in practice. It becomes more than ever necessary for the medical man to read, if he is to give his patients what they have every right to expect.

DICTIONARY OF PRACTICAL MEDICINE

BY MANY CONTRIBUTORS

ABDOMINAL SURGERY, MISCELLANEOUS.

A. Rendle Short, M.D., F.R.C.S.

Sterility of the Peritoneum.—It has been customary to teach that the normal peritoneal cavity is germ-free. According to K. Roberts, W. W. Johnson, and H. S. Bruckner,¹ of New York, this is untrue. In 80 per cent of individuals the healthy peritoneal cavity yields bacteria, both in the male and in the female. The germs found are diphtheroids, staphylococci, spore-bearing anaerobes; *Bacillus coli* is relatively infrequent.

Local Anæsthesia for Abdominal Operations.—G. Bankoff,² of Manchester, maintains, and with good reason, that if a thoroughly satisfactory local anæsthesia can be obtained for abdominal cases that are gravely ill, it is much safer than spinal anæsthesia, and therefore preferable. So far local anæsthesia has been unreliable, and splanchnic anæsthesia by the posterior route thoroughly dangerous. He has performed 500 operations, including gastrectomies and hysterectomies, with complete insensibility in all cases. His method is to prepare with morphine $\frac{1}{4}$ gr. and scopolamine $\frac{1}{100}$ gr. half an hour before, then to inject 1 per cent novocain to anæsthetize an area in the form of a rhomb (Fig. 1), deep enough to penetrate the rectus sheath and internal muscle fascia. At each of the six points in the figure 20 c.c. of fluid are injected. The fascia is not difficult to feel because it offers a resistance to the needle, which gives a special sensation to the fingers. Ten minutes after this procedure the field is completely insensible. When the skin and muscles have been cut and the peritoneum exposed, instead of opening it the whole length of the wound a small incision is made about two inches long, through which 200 c.c. of $\frac{1}{4}$ to $\frac{1}{2}$ per cent novocain solution are poured into the abdominal cavity. It is now necessary to wait for five or ten minutes before proceeding with the operation. After this the peritoneum is opened and the operation performed. This completed, the superfluous fluid is taken from the abdominal cavity by means of swabs or a suction pump. The result is that the peritoneum and viscera are completely relaxed and insensitive. For hysterectomy, a little fluid should be injected into the broad ligament before cutting. The anæsthesia lasts about two hours. There is no risk of novocain poisoning.

Burst-open Abdominal Incisions.—Following a study in 1932 by S. Sokolov, of Leningrad, of 730 cases in which the abdominal incision burst open and the intestines were exposed and prolapsed, a number of American surgeons have published observations on this melancholy subject. Papers

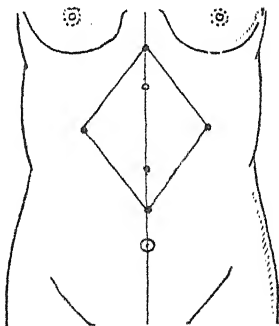


Fig. 1.—Diagram showing the points of injection. (Re-drawn from the 'Lancet'.)

are contributed by R. Colp,³ R. V. Grace,⁴ W. Craeford White,⁵ C. G. Heyd,⁶ and F. L. Meleney and E. L. Howes,⁷ all of New York. According to Colp, it followed in about 1 per cent of 2750 consecutive cases, and the mortality was 28 per cent. Grace reviews 46 cases at one hospital in fifteen years, of which 39 per cent died; and White refers to 30 cases, of which 53 per cent died. Heyd personally has had 4 out of 2145 laparotomies; and Meleney and Howes again report that disruption occurs in about 1 per cent—55 cases in eight years; 44 per cent died. The accident is much commoner with vertical than with transverse incisions, and the upper abdomen gives way more often than the lower. General weakness, carcinoma, post-operative distension, and drainage all predispose to this disaster. It most commonly occurs about the seventh day. All kinds of suture methods appear to yield their quota. [We should be greatly surprised and dismayed to think that this grave catastrophe occurred in any British hospital or nursing-home of repute anything like as frequently as in 1 per cent of all laparotomies. By the use of the Sloan or transverse incisions in the upper abdomen, whenever possible; by taking great care to approximate the peritoneum well without any loopholes to ensnare omentum; by the use of the oblique, McBurney, or Battle incisions for appendicitis, and carrying drains through a stab-wound instead of through the main incision, the incidence of post-operative rupture can and ought to be kept far below the figures quoted. Our own practice is to close the peritoneum with one continuous catgut suture of No. 2 thickness, the muscles with another of No. 4 thickness, and the skin with a continuous silkworm-gut stitch—more comfortable for the patients than clips, which are apt to catch in the dressings—reinforced by one or two deep silkworm-gut stitches taking a wide bite going down to the peritoneum but not through it. These are left in twelve days.—A. R. S.] Perhaps it is on account of disasters such as those quoted above that M. R. Reid, M. M. Zinniger, and P. Merrell,⁸ of Cincinnati, advocate the use of through-and-through silver wire sutures. They admit that a little infection usually takes place, and that the patients complain of pain.

Date of Getting the Patient out of Bed.—Whilst New York has been lamenting the burst-open abdomen, Lyons has been moving to get the abdominal patient out of bed earlier! A. Chalié⁹ argues in favour of his own practice, which is to get interval appendix cases up after forty-eight hours, and patients who have had abdominal gynaecological operations, gall-bladder, and stomach cases up between the third and the fifth days—that is to say, as soon as post-operative shock has passed off. For the first few days, of course, the patient only stays up fifteen to thirty minutes. He claims by this means to shorten convalescence, hasten the return to normal of the bladder and bowel functions, avoid phlebitis and pulmonary complications, and enable the patient to go home in ten to fourteen days. In particular, the early rising avoids the venous stasis which leads to pulmonary embolism. In children there is no special reason to hasten getting out of bed. Cases where the operation was on a septic area, or drainage has had to be used, are not suitable. Hernia and prostate cases are quite suitable. After operations on the colon a longer stay in bed is indicated. Of course if the pulse is feeble, or the patient is anæmic, he should be kept in bed. To render early rising safe, a reliable method of wound closure must be used, and a large strong support of adhesive plaster fixed on to protect the wound. M. A. Charbonnier¹⁰ writes briefly to the same effect.

The Quarantine Drain.—R. C. Coffey,¹¹ of Portland, Oregon, calls attention to his modification of the Mikulicz pack, which he calls the 'quarantine drain'. It consists of strips of gauze pack surrounded by four thicknesses of rubber-tissue; it is much the same as the 'cigarette-drain' that used to have a vogue

in this country. It is very valuable, in his opinion, to shut off an infected or inflamed organ, such as empyema of the gall-bladder, or pyosalpinx, from the general peritoneal cavity, to prevent two intraperitoneal surfaces from adhering to one another, or to arrest hæmorrhage from a bleeding surface.

Excoriation around Fistulæ.—Gastric, duodenal, and intestinal fistulæ are apt to give rise to digestion of the skin by trypsin, and a good protective dressing is greatly to be desired. F. W. Cotini,¹² of New York, speaks very highly of *kaolin powder*. The method is not new.

Neuralgia of the Abdominal Wall.—In a certain number of patients complaining of abdominal pain the cause does not lie in any of the viscera, but in the nerves of the abdominal wall. The nerves may be irritated by lordosis, scoliosis, osteo-arthritis, or caries of the lower dorsal spine. They often suffer much futile treatment for supposed gastric ulcer, appendicitis, etc. J. B. Carnett and W. Bates¹³ advise spinal exercises and supports for cases of this kind; fattening them up may of itself be sufficient to cure, and if the legs are unequal with scoliosis, a raised shoe is called for. Arthritis of the spine responds to radiant heat or X rays, and the eradication of toxic foci. If novocain injection into the intercostal nerves stops the pain, the relief may be made permanent by alcohol injection or resection; two or three nerves should be dealt with at a time, but unless the painful area is confined to that supplied by one or two nerves, the method will fail. If the pain is worse in the early morning, a firmer mattress or a different bed may relieve. Patients with an underlying spinal-nerve-root irritation often have an acute exacerbation due to transient toxæmias or menstrual upsets, and these will require correction. Sometimes the neuralgia follows injury of the spine or rib.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, Dec., 752; ²*Lancet*, 1934, i, 287; ³*Ann. of Surg.* 1934, Jan., 14; ⁴*Ibid.* 28; ⁵*Ibid.* 34; ⁶*Ibid.* 39; ⁷*Ibid.* 5; ⁸*Ibid.* 1933, Nov., 890; ⁹*Lyon chir.* 1934, May-June, 261; ¹⁰*Ibid.* 304; ¹¹*Amer. Jour. Surg.* 1934, May, 417; ¹²*Ibid.* 1933, Aug., 242; ¹³*Ibid.* Nov., 820.

ACHLORHYDRIA.

Robert Hutchison, M.D., F.R.C.P.

In an elaborate critical review of this subject T. H. Oliver and J. F. Wilkinson¹ arrive at the following conclusions:—

1. Achlorhydria is more common in women than in men.
2. While achlorhydria is common, the use of histamine has shown that achylia is rare, except in cases of pernicious anæmia.
3. It may occur in apparently healthy subjects, but it is rare in those who are completely normal, and it may be the forerunner of disease developing many years later.
4. There is a strong hereditary or familial tendency to the condition, and a family history of anæmias, allergic disease, or rheumatoid arthritis is frequent.
5. Achlorhydria may occur at any age, but is more common in later life.
6. Its etiology may be (a) familial, due to a constitutional abnormality, (b) due to chronic gastritis either from direct irritation or from a hæmatogenous intoxication, and (c) of neurogenic origin.
7. It is common in debilitating diseases, especially tuberculosis, malaria, and chronic colitis.
8. It occurs frequently in association with certain functional disturbances, neurasthenia, flatulence, irregularity of the bowels, debility, slight anæmia, and disturbances of the tongue.
9. The association of two or more of these symptoms may produce a clinical picture which has hitherto been diagnosed as a neurotic dyspepsia but which should be regarded as a syndrome of achlorhydria. This syndrome is often associated with rheumatoid arthritis or some allergic manifestation.

10. Achlorhydria is often associated with organic disease of the gastro-intestinal tract, chronic gastritis, gastric and intestinal cancer, colitis, and dysentery; of necessity it follows total gastrectomy, but it may or may not follow partial gastrectomy or gastro-enterostomy.

11. It has been looked upon as evidence of chronic gastritis, which in turn has been regarded as a precursor of cancer of the stomach. The sex incidence and the infrequent combination of the achlorhydric anemias with cancer suggest that it is not an important etiological factor.

12. Achlorhydria is very rare in duodenal ulcer, but less uncommon in gastric ulcer. When it occurs it is probably the result of a secondary chronic gastritis.

13. Severe pain occurs in some cases of achlorhydria and may resemble that of ulceration. X rays have shown the presence of an increased gastric and intestinal motility and of pylorospasm which probably accounts for this symptom.

14. Achlorhydria is frequent in cholecystitis and diseases of the liver.

15. It is an almost constant accompaniment of pernicious anemia and of subacute combined degeneration of the spinal cord.

16. It is frequently associated with the microcytic anemias.

17. There is evidence to show that the absence of hydrochloric acid is not the main etiological factor in pernicious anemia but may be an important factor in the development of the microcytic anemias.

18. Achlorhydria is common in hyper- and hypothyroidism and in diabetes.

19. It occurs in rheumatoid arthritis and should be looked for especially in patients suffering from this disease who exhibit symptoms of diarrhea, glossitis, or a slight anemia.

20. It is common in allergic disease, asthma, migraine, urticaria, and in dermatoses such as rosacea and psoriasis which have not been shown to be of allergic origin.

REFERENCE.—¹*Quart. Jour. Med.* 1933, xxvi, July, 431.

ACHLORHYDRIC ANÆMIA. (See BLOOD DISEASES.)

ACHOLURIC JAUNDICE. (See BLOOD DISEASES.)

ACIDOSIS IN CHILDREN. (See CYCLICAL VOMITING.)

ACNE VULGARIS. (See also SKIN, PYOGENIC INFECTIONS OF.)

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

A. Whitfield¹ discusses the cause and treatment of acne vulgaris. He considers that in adolescence the recently functioning sebaceous glands are in a state of temporary imbalance. As a result very slight deviations from the normal in the blood supplied to them are sufficient to upset the quality and quantity of the secretion, and to call forth, with or without the agency of the microbacillus of acne, the clinical symptoms of acne. The cause of this upset arises in the intestinal canal. Inborn characteristics of the skin play a strong part, those with naturally large and very active glands suffering more from the upset, and hence from acne, than those with less active glands. In acne of the adult the digestive symptoms are more pronounced and always to be detected, since after the glands have matured for some time, they require a greater deviation from the normal in the matter of their nutrition to cause disease. The treatment he recommends, therefore, is, in the first place, directed to regulation of the diet. He points out that it is undesirable to cut down too heavily the diet of rapidly growing youth, and therefore suggests the

following modifications. Cheese of all kinds, chocolate, and cocoa should be rigidly excluded, as should suet pudding. These have all a high fat content and are difficult to digest. Bacon, ham, sausage, duck, and goose are kept very low, also on account of their high fat content. Butter, cream, full milk, and eggs should be taken only in moderation. Skim milk, however, may be taken freely. All other meats, fish, fruit, and vegetables, especially green-leaf vegetables and carrots, should be eaten very freely.

Of drugs internally administered he has had good results with four different remedies: (1) *Sulphuric acid*, which is claimed by some to be almost a specific in acne; it is apt to be constipating and should be given with an aperient, such as sodium sulphate. (2) *Calc sulphurata*, which should be given in doses of not less than 2 gr. three times a day. (3) *Tin preparations*. (4) Intestinal antiseptics; of these he thinks *creosote* is the best, but to obtain results it should be given in doses of not less than 6 min. three times a day and the urine should be watched for toxic effects.

For local treatment he puts most reliance on *mercury* and *sulphur*. For very suppurative cases fomentations of 1-4000 perchloride of mercury applied for five minutes at night, often act like a charm. It is best to wash the face thoroughly first with soap and water. By adding 1 oz. of common salt to each pint of the mercury solution a hypertonic solution is produced which is helpful in some cases. Mercury can also be used by adding 1 to 2 per cent of the yellow oxide to calamine lotion; 4 per cent borax may also be added to saponify the grease of the skin, but if this is done no glycerin should be used in the lotion. The author advises caution in the use of this lotion as he has seen an erythematous dermatitis produced by it. Mercury is of most value in the suppurative cases. In others he uses sulphur, and advises the following lotion:--

R Precipitated sulphur	1½ drachms	Prepared calamine	3 drachms
Borax	2½ ..	Acetone	1½ oz.
Zinc oxide powder	2 ..	Camphor water to	8 ..

REFERENCE.--¹*Brit. Jour. Dermatol. and Syph.* 1934, June, 257.

ACTINOMYCOSIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

R. Klaber¹ describes a case of *primary cutaneous actinomycosis of the hand*. Cases of primary affection of the skin are rare. The case occurred in a carter and commenced in a wound on the back of the left hand, caused in 1930 by grazing on an old felled tree. The condition in 1931 is described as an area of diffuse, ill-defined, pigmented, rather 'boggy' induration, containing a few scattered pustules covering the ulnar two-thirds of the back of the left hand. By December, 1932, extensive scarring, with numerous darkly pigmented epidermal nodules and bridges, had developed. There was a well-defined violaceous proximal growing edge. Pustules were few and transient and there were never any sinuses.

Considerable difficulty arose in the diagnosis as no 'sulphur granules' were found in the pustules. After the patch had been scraped cultures were made on blood-agar from scraping from the growing edge. These cultures yielded a pure growth of the *Bacillus actinomycosis comitans*, an organism which has only been found in cases of actinomycosis, although not apparently related to the causative fungus. The discovery of this organism caused the author to make serial sections and minute nodules of actinomycosis were then found.

REFERENCE.--¹*Brit. Jour. Dermatol. and Syph.* 1934, Jan., 12.

ADDISON'S DISEASE. (See ADRENAL GLANDS.)

ADRENAL GLANDS. (*See also* ENDOCRINE SYSTEM, INTEGRATION OF.)*Sir Walter Langdon-Brown, M.D., F.R.C.P.*

F. A. Hartman,¹ reviewing the functions of the adrenal cortex, maintains that *cortin* is useful in the treatment of neurotic states because of its steady influence on conditioned reflexes. He points out that sooner or later cortical insufficiency will lead to renal damage. It is well known that the adrenals, especially the cortical portion, hypertrophy if the supply of vitamins B and C (but not of A) is inadequate. This appears to be owing to the production of a substance which delays the onset of symptoms due to such deficiencies. The association of the adrenal cortex with the gonads is also well recognized, as is the frequent occurrence of low blood-sugar in adrenal deficiency. But of late much interest has been taken in the disturbance of salt metabolism in adrenal defects. Baumann and Kurland in 1927 observed a fall in plasma sodium and a rise in its potassium after experimental adrenalectomy, and Loeb confirmed this in 1932 for Addison's disease. This is the basis for the administration of large quantities of isotonic sodium salt solutions for this condition, which is now widely recommended for the relief of the dehydrated condition of the patient. G. A. Harrop and others² are much less favourably impressed with the therapeutic benefits of cortical extracts than most other observers. Hartman claims to have isolated another hormone from the cortex besides *cortin* which is necessary for the stimulation of lactation, to which he has given the name 'cortilactin'.

Levy Simpson³ maintains that it is necessary to give *cortin* at the same time as the saline, otherwise it is not absorbed. He attributes the rise of blood-urea in the earlier phases of Addison's disease to the dehydration, but in the terminal stage to failure of renal function. Secondary anaemia is probably the result of achlorhydria, which is common in this disease. He is not convinced that *cortin* has a beneficial effect on most types of neurasthenia, myasthenia gravis, or muscular dystrophias. He thinks it may be reasonably employed in certain cases of infection, post-infective debility, and various dehydration states. He has made the interesting observation of the presence of the male sex hormone in the urine of women suffering from adrenal virilism. Mild virilism in women is by no means uncommon, and Broster and Vines have found that in virilism the adrenal cortex stains deeply with Ponceau fuchsin, which the normal cortex fails to do. This provides us with a surer pathological basis. Discussing the connection between pituitary and adrenal virilism, Levy Simpson points out that Cushing's syndrome suggests that the influence of the basophilic adenoma on the homosexual glands is an inhibitory one, allowing the development of a latent heterosexual rudiment. He recalls two reported cases of Cushing's syndrome without a pituitary basophilic adenoma but associated with carcinoma of the thymus, which he believes inhibits homosexual function. The whole paper is full of interest.

Addison's Disease occurring in the Course of Pulmonary Carcinoma.

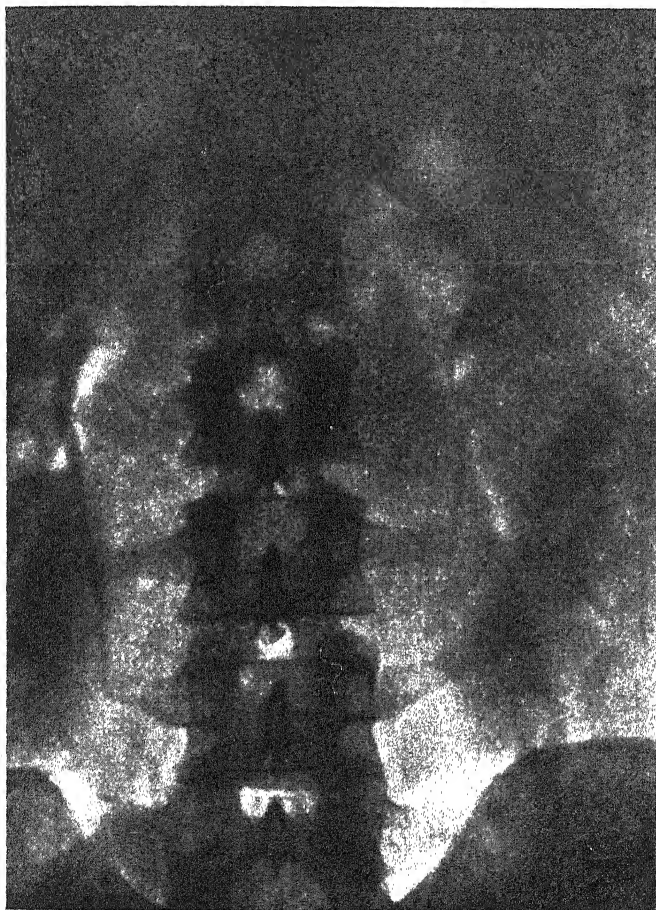
—As is well known, Addison, in his original account of the disease called after him, reported two instances due to malignant disease involving the adrenals. It is not so well known that in both cases the primary growth appeared to be in the lung. F. J. Poynton and others⁴ report two cases of a similar sort in which symptoms of Addison's disease developed in the course of pulmonary carcinoma, and in which autopsy revealed secondary deposits in both adrenals in one case, and in the left adrenal in the other. Records of secondary neoplasms giving rise to Addison's disease are remarkably scanty when one considers the frequency with which these organs are involved by malignant growths.

REFERENCES.—¹*New Eng. Jour. Med.* 1933, Sept., 480; ²*Jour. Amer. Med. Assoc.* 1933, June, 1850; ³*Proc. Roy. Soc. Med. (Clin. Sect.)* 1933, Dec. 9, 383; ⁴*Lancet*, 1933, i, April 8, 740.

PLATE I

CALCIFICATION OF THE LEFT ADRENAL

(HAMILTON BAILEY)



Skiagram showing calcification of the left adrenal. When examined after excision it was as hard as a pebble.

ADRENAL GLANDS, SURGERY OF. (*See also* KIDNEY, SURGERY OF—*MALIGNANT KIDNEY.*) *Hamilton Bailey, F.R.C.S.*

Calcification.—Calcification in the adrenal glands casts a shadow in the X-ray which is difficult to interpret accurately. In *Plate I* such a shadow can be seen in conjunction with an excretion pyelogram. The patient was a man of 28 and complained of pain in the back following an accident. The adrenal gland was excised and was shown to be completely calcified and as hard as a pebble.

Adrenal Sexual Precocity.—L. P. Player's¹ patient was a boy of 4½. His stature was that of an adolescent, while his genitals were of adult proportions. Pubic hairs were plentiful and he had a distinct moustache. A left adrenal cortical tumour the size of a large apple was removed. Twenty months after the operation he was alive and well.

Melanoma of the Adrenal.—This occurs occasionally. R. C. McComb and D. B. Smith's² patient died within thirteen months, and at the necropsy multiple secondary subcutaneous growths were found.

Effect of Visceroptosis on Adrenals.—O. S. Fowler³ considers that many of the untoward general symptoms associated with profound visceroptosis are due to drag upon the adrenal bodies, and, as a consequence, the blood-supply to these glands becomes deficient, and partial adrenal atrophy ensues.

Transplantation of the Adrenal Glands in Addison's Disease.—The symptoms of Addison's disease are due to adrenal insufficiency. A promising form of treatment for this otherwise hopeless condition is grafting the adrenal glands from a subject who has recently died. The opportunities for carrying out this measure are naturally infrequent, and the chief difficulty is in obtaining suitable adrenal glands. The ideal would be to remove the adrenals from a healthy adult within an hour or two of death from an accident. In the few cases in which adrenal grafting has been possible the glands from a still-born infant have usually been employed. F. A. d'Abreu⁴ considers that grafts in strips are more likely to function than whole transplants. The best situation for the insertion of the graft is not finally settled. W. E. Tanner,⁵ who grafted an adrenal into the testis, does not consider this the ideal site. The breast has been used for the reception of the graft, but the bulk of opinion favours the anterior abdominal wall beneath the muscles in front of the peritoneum. The most satisfactory case was reported by L. Reinhart (quoted by d'Abreu). This author was able to use an adrenal of a patient still alive, obtained during nephrectomy for a tuberculous kidney. This was inserted into the abdominal wall of a patient in the last stages of Addison's disease. The site chosen for the insertion of the graft was between the peritoneum and the muscular layers. The beneficial effect was remarkable and showed itself a few days after the grafting. The blood-pressure rose from 85 to 115. Menstruation recommenced, and five months after the operation, when the case was reported, the improvement was sustained.

REFERENCES.—¹*J. Urol. and Cutan. Rev.* 1933, 758; ²*Jour. of Urol.* 1933, July, 49; ³*Ibid.* 1934, 363; ⁴*Lancet*, 1933, Dec. 28, 1478; ⁵*Ibid.* 1934, Jan. 14, 107.

A. Rendle Short, M.D., F.R.C.S.

Denervation of the suprarenal glands is neither a difficult nor a dangerous operation. G. Crile,¹ of Cleveland, has done it on more than 250 occasions, with only 2 deaths, both due to errors of technique. The operation is done in two stages. After the first gland has been dealt with there is a definite reaction: the patient becomes less conscious of his heart beating, sweating is less, the skin is subjectively warmer, and the patient quieter. If there is no such reaction, it is useless to operate on the other side. The indications

for this form of treatment are 'neuro-circulatory asthenia', for which it is definitely a cure; hyperthyroidism, especially when it recurs after thyroidectomy; peptic ulcer, in which dramatic results may be obtained; and occasionally epilepsy. It is contra-indicated in cases of high blood-pressure or of Buerger's disease. The operation is much more effectual than unilateral adrenalectomy; the writer has performed this on 52 occasions, with no untoward effects, but with little benefit.

REFERENCE.—¹*Amer. Jour. Surg.* 1934, May, 378.

AGRANULOCYTIC ANGINA. (See BLOOD DISEASES.)

AIRMEN, FUNCTIONAL EFFICIENCY IN.

A. G. Gibson, M.D., F.R.C.P.

H. A. Tredgold,¹ in treating of functional efficiency in airmen, defines this efficiency as the capacity to endure severe physical and mental stress together with a high resistance to disease. So far as he deals with the cardiovascular system his conclusions are that the person who is under-weight is usually of poor physique, is not as a rule efficient in athletics, tends to have a small heart, a more rapid pulse, and a subnormal vital capacity. Usually this type has a faulty family or personal history revealing poor mental stamina. A young adult, although under-weight, may be physically efficient. In this case, however, the pulse-rate is usually 72 or under, the vital capacity is good, and the previous and family histories are good. The relationship between the body build and the functional efficiency shows that the more efficient men are found amongst those that are over-weight in comparison with the average for the age and height. This is borne out by the figures for invaliding from the Service, which is commoner amongst under-weight individuals. Under-weight also carries a greater tendency to infectious disease and more invaliding from that cause.

REFERENCE.—¹*Lancet*, 1934, i, June 30, 1377.

AMOEBIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

A survey of the amoebic infections in a Mauritius prison is recorded by A. R. D. Adams,¹ with the result that *E. histolytica* was found in 31.6 per cent of juveniles and 38.5 per cent of adults. An account of nine amoebic infections contracted in Chicago and seen in Minnesota is recorded by K. Ikeda.² Chronic amoebic infection as a source of ill health is discussed by G. T. Burke³ from Indian experience, with illustrative cases, many of the patients thinking they were suffering from abdominal tuberculosis. The writer confirms the observations of Rogers on the importance of right iliac symptoms in the recognition of such cases even in the absence of clinical dysentery or diarrhoea, and the danger of their being mistaken for appendicitis. E. C. Faust and G. S. Kogaz⁴ found in infected dogs superficial erosions, typical bottle-necked ulcers, and chronic undermining with secondary bacterial infection, the last two as in man.

TREATMENT.—Yet another derivative of ipecacuanha has been tried in intestinal amoebiasis under the name of 'gavano', which is said to be a mono-methyl ester of cephaeline in combination with an organic acid, although its composition has not been revealed by its German sponsors. R. N. Chopra and others⁵ have tried it in the Calcutta School of Tropical Medicine in 18 cases in the recommended doses of one tablet twice daily orally for nine days, and 6 patients were reported to be cured, or one-third; in 10 (55.5 per cent) it failed, and the result was doubtful in the other 2, so it does not appear to be very efficient, although it is thought to be less toxic than emetine. Its amoebicidal properties were not so good as those of E.B.I. or kurchi alkaloids. R. N.

Chopra⁶ reports further on the alkaloid kurchicine, and finds it to produce well-marked fall in blood-pressure and depression of the heart with complete heart-block in toxic doses. Only animal results are recorded.

II. II. Anderson and A. C. Reed⁷ report further on 200-c.c. enemas of 1 per cent carbarsone in 2 per cent sodium bicarbonate last thing at night after a sedative of sodium amytal, repeated until they have been retained on five occasions, and they found them of value when the oral use of the drug had failed. The same workers⁸ report on untoward effects of amœbicidal drugs, and point out that while total emetine doses of 10 mgrm. per kilo are safe, quantities of 10 to 25 mgrm. may cause toxic symptoms. Kurchi alkaloids produced no toxic signs, but in one of every six amœbic cases treated with stovarsol (acetarsone) toxic symptoms appeared after total quantities of 5 gm. In extensive trials of carbarsone orally and rectally in total quantities of 75 to 2100 mgrm. per kilo over periods up to fifteen months, intolerance was only noted in one case of hepatitis after 5 gm. in ten days.

REFERENCES.—¹*Ann. Trop. Med. and Parasitol.* 1934, March, 29, 25; ²*Jour. Amer. Med. Assoc.* 1933, Dec. 16, 1945; ³*Ind. Med. Gaz.* 1933, Oct., 565; ⁴*Amer. Jour. Trop. Med.* 1934, March, 221; ⁵*Ind. Med. Gaz.* 1934, March, 130; ⁶*Ind. Jour. Med. Research*, 1933, Oct., 277; ⁷*Amer. Jour. Trop. Med.* 1934, March, 257; ⁸*Ibid.* 269.

ANÆMIA. (See also BLOOD DISEASES; PHARMACOLOGY AND THERAPEUTICS—IRON.)

ANÆMIA, PERNICIOUS.

Stanley Davidson, M.D., F.R.C.P.E.

ETIOLOGY.

No evidence has been produced during the past twelve months which may be held to disprove Castle's fundamental hypothesis that the essential cause of Addisonian pernicious anæmia lies in a failure of gastric secretion. Nevertheless it can be truthfully said that an adequate explanation of why and how this failure arises is still lacking. Attention is once more being paid to heredity, constitution, and race as predisposing factors. Statistical evidence in favour of definite racial discrepancies in the incidence of pernicious anæmia appeared in 1921 as the result of a clinical study of 150 cases by S. A. Levine and W. S. Ladd.¹ An investigation of the racial factor in 500 cases admitted to the Peter Bent Brigham Hospital, Boston, between 1913 and 1932, has been made by R. D. Friedlander.² During this period 14,251 (17·9 per cent) of the total admissions were persons from Eastern and Southern Europe, yet only 32 (6·4 per cent) of the pernicious anæmia cases were from this group. In contrast, 66,164 of the total admissions were from the United States of America, Canada, Great Britain, and Denmark; and 465 (93 per cent) cases of pernicious anæmia came from these countries. Another striking figure submitted by Friedlander is derived from a study of the number of Canadians and Russians who were admitted to hospital during the past twenty years. There were approximately 7000 patients from each of these races, yet there were only 14 Russians with pernicious anæmia, as compared with 81 Canadians. The author also produces evidence in favour of the constitutional factor, the latter being embodied in individuals with a diathesis characterized by fair complexions, light hair, and light-coloured eyes. Lastly, evidence in favour of the familial factor has been adduced by many previous workers who have cited the not infrequent occurrence of pernicious anæmia in two or more members of a family. In addition, the frequency with which achlorhydria or anæmia occurs among the relatives of patients suffering from pernicious anæmia is well recognized. C. C. Sturgis and R. Isaacs³ report that 27 per cent of their patients with pernicious anæmia stated that there was an additional case of anæmia

in the family, whereas only 9 per cent of the non-pernicious anæmia group of equal numbers gave an affirmative answer to this question.

The data submitted above suggest that certain types of individuals inherit a weakness of the stomach in secreting hydrochloric acid and enzymes. If the failure lay particularly in acid secretion, the germicidal barrier to the entrance of pathogenic micro-organisms would be lost, with the consequent liability to chronic gastritis. This in turn might gradually destroy the power of secreting intrinsic factor, and a megaloblastic anemia would develop.

PATHOLOGY OF THE GASTRO-INTESTINAL TRACT IN PERNICIOUS ANÆMIA.

Since 1897 151 autopsies on cases of pernicious anæmia have been carried out in various hospitals in Boston. A study of this material has been made by Madelaine Brown.⁴ Gross lesions of the gastro-intestinal tract were present in 82 cases. The commonest source of infection was the gall-bladder, since cholecystitis or cholelithiasis occurred 24 times. A microscopic examination

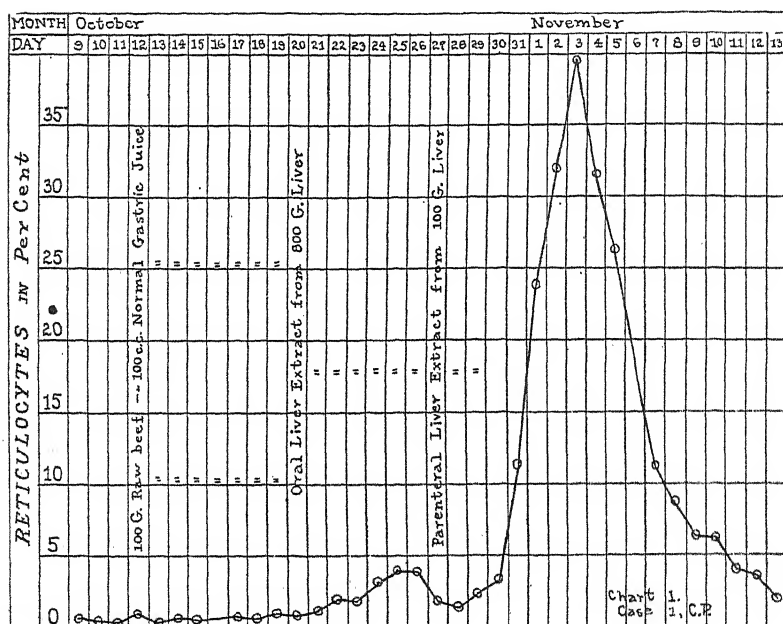


Fig. 2.—Chart showing curve of reticulocytes. No response from raw beef plus normal gastric juice; only slight response to large amount of liver extracts by mouth, but prompt and marked response to liver extract intramuscularly. (Reproduced from the 'New England Journal of Medicine'.)

of the histopathology of the gastro-intestinal tract was carried out in 42 instances. In 41 chronic gastritis was found; in 37 the acidophilic cells had disappeared. If this work is accepted it is understandable why a failure in the secretion of ferments, hydrochloric acid, and intrinsic factor occurs in pernicious anemia. Another point of interest in this report is the frequency with which chronic enteritis was found; the consequent failure in absorption would explain why some cases of pernicious anemia fail to respond to oral treatment but respond

to parenteral treatment, and why liver extract is thirty times more potent when given by injection than when taken by mouth. That a conditioned deficiency resulting from a failure in absorption is of real clinical importance is well illustrated by *Fig. 2*, which appeared in a paper by J. E. Connery and L. J. Goldwater.⁵

Studies of gastro-intestinal enzymes in autopsy specimens in cases of pernicious anæmia have been made by O. M. Helmer, P. J. Fouts, and L. G. Zervas.⁶ The authors found that the gastric mucosa contained no pepsin or rennin. In contrast, the duodenal mucosa and pancreatic tissues contained normal amounts of enterokinase and tryptic, amylolytic, and lipolytic enzymes. This work confirms the generally accepted view that the essential secretory defect in pernicious anæmia is of gastric origin.

The Site of Formation of Intrinsic Factor.—I. Meulengracht⁷ has studied the problem of where the intrinsic factor is secreted by treating cases of pernicious anæmia with powdered extracts made from the pars pylorica, fundus, and cardia of the pig's stomach. Defatted and dried preparations of the fundus were found to be impotent, in contrast to pyloric preparations, which were strongly active. Experiments with preparations from the cardia had not been completed.

In view of these findings the reviewer is surprised that pernicious anæmia following gastrectomy so rarely occurs in man. It is possible, however, that the site of secretion of intrinsic factor in man and pig may not be the same.

TREATMENT.

Liver.—For the past two years the reviewer has treated the majority of cases of pernicious anæmia attending the Aberdeen Blood Clinic by intramuscular injections of liver extract. The reasons for the change from peroral treatment with liver or liver extract to parenteral treatment were twofold: firstly, the expense of liver extract was prohibitive to anyone but the well-to-do; the average maintenance dose of liver extract was about one tube of the solid extract obtained from 250 gm. of liver taken four or five times weekly. The weekly cost was therefore at least ten shillings. A fortnightly injection of a 5 c.c. ampoule of Campolon was found to be more effective, and the cost was 2/10. Secondly, after the preliminary enthusiasm resulting from the beneficial effects of the initial treatment had waned, many persons could not be relied upon to take regularly an adequate maintenance dose of liver or liver extract. In consequence the blood level was not maintained at the optimum, and the danger of subacute combined degeneration of the cord occurring became a serious matter.

Since the patients report at the Clinic at regular intervals for blood examination, adequate data are now at our disposal to evaluate the effects of intramuscular treatment. It is possible to state without hesitation that intramuscular treatment given at intervals of two or three weeks is the cheapest, and, for the majority of persons, the best method available at present for maintaining a normal blood level. A similar opinion is held by competent observers in America; thus W. P. Murphy⁸ reports excellent results in a series of 100 cases treated intramuscularly with an extract derived from 100 gm. of liver, concentrated to 3 c.c. and injected at intervals varying from one to six weeks. For those who object to injections at fortnightly intervals it is possible to prolong the period to a month, by getting the patient to eat reasonable helpings of liver on two or three days weekly. For those who refuse to undergo parenteral treatment the blood level is best maintained within normal limits by taking alternately on four or five days in the week liver ($\frac{1}{4}$ to $\frac{1}{2}$ lb.) and a gastric tissue

preparation (e.g., pepsac, two tablespoonfuls). Oral liver extract at its present price can no longer be recommended.

Iron.—Since pernicious anæmia arises from a deficiency of the specific anti-anæmic factor contained in liver, iron by itself is therapeutically ineffective. Iron was not required when treatment with whole liver was the standard regimen, since this organ is particularly rich in the metal and the rise in the blood-count following whole liver treatment was not rapid. The position, however, is different with parenteral treatment, since the material injected is iron-free and the rate of blood formation is exceedingly rapid. In consequence it is found that the body's reserve stores of iron are rapidly utilized within the first month of treatment, in order to supply the large requirements for hæmoglobin synthesis which occur when red cells are being produced at the rate of 100,000 per cubic millimetre per day. An iron deficiency can readily be recognized in patients treated with active preparations parenterally, since the colour index falls from its high figure to one below unity. In all cases undergoing parenteral treatment during the relapse stage of pernicious anæmia iron should be administered in large doses. We have found a marked acceleration in the speed of recovery, both of the hæmoglobin level and in the patient's physical condition, by giving 60 to 90 gr. of iron and ammonium citrate, or 9 gr. of a ferrous sulphate or chloride pill, daily, for the first two months of treatment. In the papers by Murphy, referred to above, the value of iron is strongly emphasized where parenteral treatment is the method of choice.

Liver-Gastric-Tissue Preparations.—G. B. Walden and G. H. A. Clowes⁹ reported last year that when subminimal amounts of liver or liver extract were incubated with small amounts of fresh hog's gastric tissue and fed to patients with pernicious anæmia, an enhanced activity resulted which was much greater than the effects of the two preparations when given individually to the patients on alternate days.

P. J. Fouts and L. G. Zerkas¹⁰ demonstrated the same effect when subminimal amounts of liver were incubated with normal gastric juice. These workers report the clinical results observed when patients were treated with Walden and Clowes' preparation, which is now sold under the trade name of 'Extralin' and manufactured by Eli Lilly and Company. The preparation is sold in the form of capsules, and the authors claim that twelve capsules daily produced a maximal reticulocyte rise and was adequate to maintain a normal blood level. Details regarding costs are not at present available to the reviewer.

Yeast, Autolysed Yeast, and Wheat Embryo.—The therapeutic value of preparations of these substances has been tested during the past three years in a series of 18 cases of pernicious anæmia by C. C. Ungley and G. V. James.¹¹ Eight cases entirely failed to respond, while in the remaining 10 some hæmopoietic effect resulted, which, however, was frequently suboptimal. In order to determine the value of the active hæmopoietic principle present in yeast preparations, extracts were prepared and administered parenterally. Negative results were obtained; it may, therefore, be safely assumed that any potency in such preparations resulted from activation of extrinsic factor which occurs in such rich amounts in yeast products, by traces of intrinsic factor secreted by the patient's stomach. These findings entirely substantiate the reviewer's opinions based on his own experiments in this field, which were given in detail in last year's MEDICAL ANNUAL (p. 33), viz.: (1) That in their present form yeast or its products cannot be considered to be substitutes for liver, liver extracts, or gastric tissue products; (2) That the variation in response to

treatment with yeast preparations can be explained by definite variations in the degree of failure in secretion of intrinsic factor.

REFERENCES. —¹*Bull. Johns Hopkins Hosp.*, 1921, xxxii, 254; ²*Amer. Jour. Med. Sci.*, 1934, May, 684; ³*Calif. and Western Med.*, 1933, xxxix, Aug., 73; ⁴*New Eng. Jour. Med.*, 1934, cci, March 1, 473; ⁵*Ibid.*, 1933, Aug. 31, 446; ⁶*Arch. of Internal Med.*, 1934, May, 675; ⁷*Acta. med. Scand.*, 1934, lxxxii, 352; ⁸*Amer. Jour. Med. Sci.*, 1933, Aug., 271, Sept., 361; ⁹*Proc. Soc. Exper. Biol. and Med.*, 1932, xxix, April, 873; ¹⁰*Jour. Amer. Med. Assoc.*, 1933, July 15, 188; ¹¹*Quart. Jour. Med.*, 1934, Oct., 523.

ANÆSTHESIA. (See also ABDOMINAL SURGERY, MISCELLANEOUS; HYPNOTICS; POISONING.) *J. Blomfield, O.B.E., M.D.*

During the past twelve months *evipan* has been the subject of a large amount of writing. Most of this has been greatly in favour of this new anæsthetic, but, as is usual in the case of the latest introduction, some writers have pointed out dangers that have become apparent, or have reported actual fatalities.¹ There has been increasing use of the drug for prolonged operations, and in the opinion of some² this, rather than short procedures, is destined to be the field in which *evipan* will most show its superiority over other general anæsthetics. At least it is plain that to regard *evipan* as a justifiable substitute for nitrous oxide for operations which can be perfectly performed under gas is a grave mistake. There is no comparison between the two as to innocuousness, and after *evipan* the patient can often not be allowed to be alone with safety for some hours. *Evipan* is liable, like the other barbiturates, to be followed by restlessness and excitement. In healthy young subjects this may even be extreme, so that the patient is with difficulty kept in bed.³ It can, however, be avoided by a dose of some opium derivative given before the *evipan*, or directly after operation. Obviously this makes the use of *evipan* for ordinary dental work inconvenient. It has been injected with benefit in the treatment of tetanus.⁴

In Germany⁵ this anæsthetic has now been used very widely. A series of over 5000 cases without mishap is recorded. The author alludes, however, to fatalities within his knowledge the cause of which was, he believes, overdosage. He points out that no stage of analgesia is to be relied on after injection of *evipan*. A second German writer⁶ describes instances of thrombosis—none, however, serious—as well as arrest of breathing during anæsthesia from *evipan*. He has collected 11 fatalities, but none among subjects in normal health except for the reason for operation. It is recommended⁷ that no premedication should be used before *evipan* except in healthy young subjects.

Alluding to the difficulty of correctly estimating dosage, which is so important with all anæsthetics that are injected irrecoverably, Monod,⁸ whose opinion is of weight, approves the oculocardiac test. This test is said to differentiate the vagotonic from the hypovagotonic, the former being more, the latter less, than usually susceptible to the action of anæsthetics. The test is carried out by pressure on the eyeball and noticing the slowing or not of the pulse. The same author lays stress on the value of intravenous injections of strychnine as an antidote to barbiturate overdose. Sebrecht⁹ uses as a test of susceptibility a preliminary injection of sedol. If the patient becomes sleepy and his pulse slows, he is susceptible, and the dose of *evipan* is to be less than normal. One writer,¹⁰ who alludes to no fewer than 100,000 cases, regards all liver affections as contra-indications to the use of *evipan*. The injection should be made at the rate of 1 c.c. every fifteen seconds, and the dose which produces sleep repeated to half its extent to get anæsthesia in strong subjects. Other writers regard the advent of a yawn as marking the dose half of which is to be repeated. Most authorities lay stress on the advisability of slow injection, and one says that the first 4 c.c. should take at least two and a half minutes.¹¹ This writer¹¹

has used as much as 18 c.c. for a short operation in a resistant subject. In a series of 137 minor gynaecological operations¹² 73.7 were regarded as satisfactory, the remainder needed additional anæsthesia. After operation there was often restlessness, sometimes headache, and occasionally nausea.

The technique of injection for prolonged operations¹³ is described, and the necessary apparatus is seen in the accompanying illustrations (*Plate II*). The needle is left in the vein and a continuous drip of hypertonic glucose serum allowed to enter. To this is added further evipan as symptoms of returning sensibility demand. The author includes within his series of 72 major operations, gastric resections, and removal of the rectum for cancer. He disapproves of evipan for operations on the anoperineal region, finding the anæsthesia usually imperfect. For premedication he limits himself to 1 c.c. of a 2 per cent solution of omnopon given an hour before operation.

Evipan is an excellent introducer of anæsthesia comparable to ethyl chloride or nitrous oxide; it must not be regarded¹⁴ as a basal narcotic, for which its

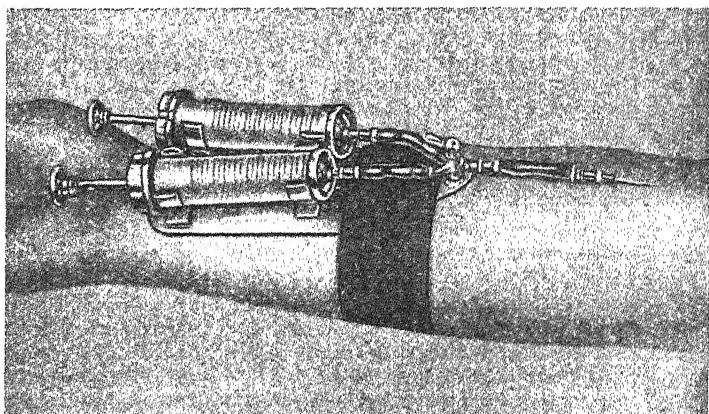


Fig. 3.—Apparatus for introduction of saline and evipan.
(Reproduced from the 'Münchener medizinische Wochenschrift')

destruction in the body is too rapid. The use of the drug for prolonged operation is increasing rapidly in Germany, and we show an alternative apparatus¹⁵ (*Fig. 3*) in which saline is supplied from one syringe and evipan from the other. In Great Britain evipan has not yet been so extensively used for major surgery. Nevertheless it meets with great favour in the eyes of those¹⁶ who have thus employed it, and a series of over 1000 administrations, of which many were for major surgery, is recorded. The authors give omnopon one hour before, and have injected as much as 40 c.c. of evipan in the course of a long operation. They mention several antidotes, notably coramine, but omit strychnine, which holds first place in the estimation of some continental operators.

*Nembutal*¹⁷ continues to be widely used before anæsthesia, and it is plain that its administration by mouth, although not so absolutely certain as the intravenous method, is practically of great value. In a series of 100 cases there was 1 failure due to underdose: 3 gr. one hour before the anæsthetic is the proceeding adopted.

The value of lumbar puncture during coma from barbituric overdose is illustrated in the account of a patient who suffered from nembutal poisoning.¹⁸

PLATE II
EVIPAN IN MAJOR SURGERY
(JESTZER, OLTRAMARE, AND PONS ET)

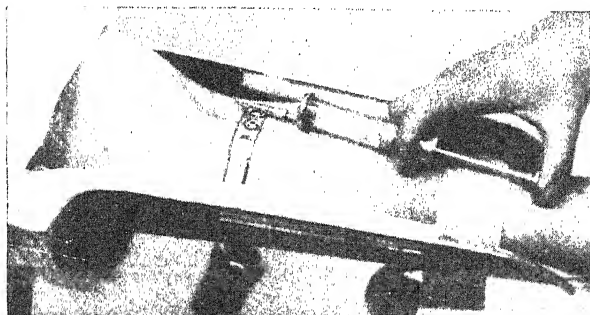


Fig. A.—Injection of evipan.

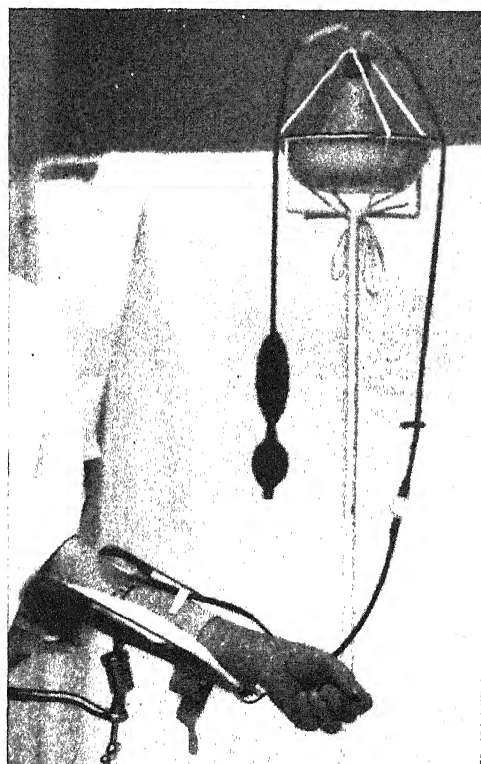
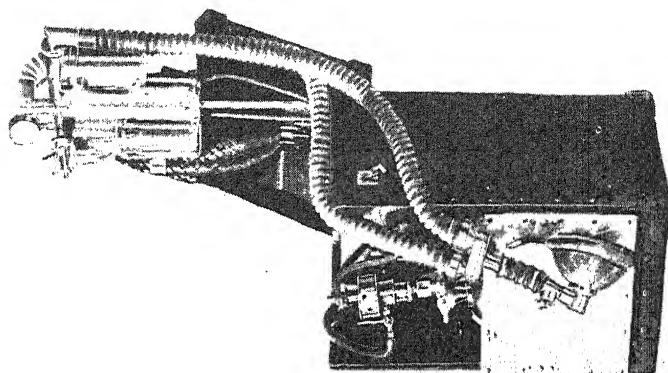
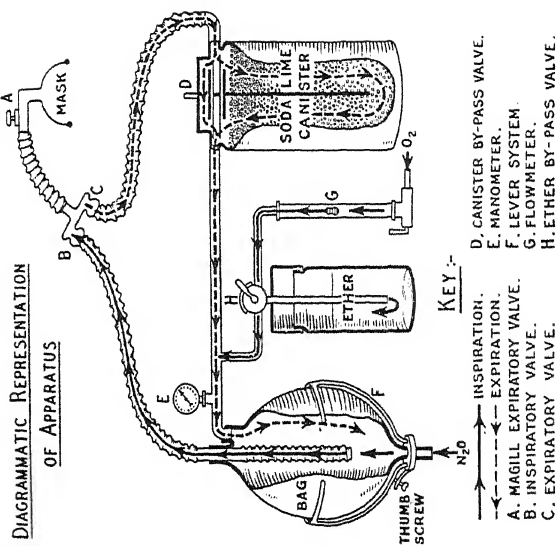


Fig. B.—Continuous use of evipan.

By kind permission of 'La Presse médicale

PLATE III—CLOSED ANAESTHESIA (T. A. B. HARRIS)



Apparatus in its portable case.
By kind permission of the 'British Medical Journal'.

Ethylene,¹⁹ which has found less popularity with anæsthetists here than it merits, continues to be much employed in America, and in answer to a questionnaire no fewer than 757,815 administrations alone, and 267,560 in combination with ether, are recorded. The somewhat elaborate precautions to avoid static electricity as a cause of explosion appear unnecessary in the more humid atmosphere this side of the Atlantic. An Italian authority²⁰ reporting on 118 cases regards ethylene as safe and highly satisfactory so long as it is given by an expert with efficient apparatus.

A good summary of the pros and cons of premedication is provided.²¹

The principle of *CO₂ absorption* in gas anæsthesia is being more and more practised, and with the advent of cyclopropane becomes still further advantageous. The successful use of this method presupposes an air-tight system which includes the patient's breathing apparatus and the anæsthetist's machine. A method of assuring this²² by means of a tube placed in the pharynx with a distensible portion to be inflated from without after the tube is in position is described. The author also describes a simple type of machine with a one-way tube by which the patient's inspirations as well as his expirations pass over the *CO₂* absorbent, in this instance a liquid one. We illustrate another apparatus for the same purpose (*Plate III*).

*Sodium soneryl*²³ has been given intravenously after the fashion of evipan and apparently with similar results, except that the author does not appear to have repeated the dose of soneryl but to have resort always to ether for prolonged operations. Used as a precursor and introduction to anæsthesia, soneryl has been most satisfactory. A dose by the mouth is given the night before operation. Half an hour before operation the intravenous injection is made, the dosage being 1 c.c. of soneryl solution per kilo. of body weight.

Another intravenous preliminary²⁴ recommended by a French writer is *paraldehyde glucose*, 6 c.c. paraldehyde per 100 serum glucose, the dose to be 0.1 to 0.2 c.c. per kilo. of body weight.

The great value of *avertin* narcosis²⁵ for operations on the subjects of toxic goitre is shown by a series of unselected patients in whom the immediate mortality was only 1 per cent. In conjunction with the avertin local injection of weak novocain was employed, and in the majority of operations gas and oxygen also.

On experimental grounds²⁶ a German authority recommends the combination of avertin, magnesium sulphate, and narcophen. The importance of ascertaining the metabolic rate²⁷ and the oculocardiac reflex before giving avertin is pointed out.

*Divinyl ether*²⁸ has received further attention, both experimental and clinical, and is extolled for its rapidity in inducing anæsthesia.

Magi²⁹ has provided an excellent summary of the latest drugs and methods for anæsthesia. He regards *cyclopropane* as an agent of enormous possibilities. Discussing *evipan*, Jarman³⁰ points out that patients who have had more than the minimum dose and been allowed to go home when apparently recovered have shown signs of drunkenness in the street. Ample time for recovery must be allowed when 3 c.c. or more have to be given.

The *carotid sinus*, a body hitherto of little interest to anæsthetists, is brought into prominence by two important communications, one physiological,³¹ the other clinical also.³² In the nerve connections of the sinus and the effect of pressure on it lies, it is suggested, the explanation of sudden death under gas. The recommendation is made that pressure just behind the angle of the jaw be avoided, and the value of a little ether is shown because this drug lessens the reflex activity of the sinus. A different explanation of sudden deaths during anæsthesia is put forward by Kemp,³³ who believes the cause to be in

most instances primarily a defect in function or substance of the adrenal cortex, with secondary dysfunction of the thyroid.

Great advantages are claimed for anæsthesia³⁴ by means of *ether vapour under high pressure*. A perfectly safe narcosis, with pleasant induction, few after-effects, and no need for any adjuvant drugs are claimed, but no account is given of how the necessary vapour is obtained.

The safety of rather large and repeated doses of *coramine*³⁵ to resuscitate those collapsed under anæsthesia has been shown. Instances are also advanced to show the effect of this drug in shortening narcosis from avertin.

It is claimed for *sodium amytal*³⁶ used as a basal narcotic that extensive operations are much less likely to be followed by shock, probably because the drug reduces the reflex activity of the diencephalon.

The combination of *luminal*, *avertin*, and *local anaesthetics*³⁷ is recommended as the best procedure for operations on the central nervous system. *Luminal*³⁸ in doses of from $\frac{1}{2}$ to 1 gr. is also advised as the best means to secure a sleep during which a child can be given an anæsthetic without this leaving any impression on his memory. Intravenous *morphia* in doses half those used hypodermically is said to be highly advantageous as the preliminary to ether narcosis.³⁹

SPINAL ANÆSTHESIA.

Spinal methods continue to provide much controversial writing. An attempt has been made⁴⁰ to determine the relative safety of this and general anæsthesia by comparing the results in a consecutive series of 4000 operations, half being done under spinal the other half under general anæsthesia. The results, both as to mortality and morbidity subsequent to operation, were extraordinarily similar in the two series.

Attention is drawn⁴¹ to the effect that the temperature of the solution has on its position inside the theca, and the author recommends the injection of *percarine* with the patient sitting up.

Trenchant criticism⁴² is directed against the routine use of *ephedrine* both on physiological and clinical grounds. Babcock, who writes the article, has performed 10,000 injections without a death, and he is a weighty authority. His article has much valuable criticism both constructive and destructive. He declares the ocular palsy occasionally seen after spinal injection to be a bacterial effect, and has not seen an example for twenty years since he used aseptic preparations. In order to use percarine in accordance with the principles of Barker, which he had always followed, Silverton⁴³ employs a 1-200 solution of percarine in a 6 per cent solution of glucose. He believes in routine injection of ephedrine before spinal analgesia for abdominal operations.

It is asserted⁴⁴ that some spinal analgesics produce lowering of the blood-pressure more readily than others and that the site of the injection also tells. Intravenous injections of *ephetonin* are advised. A dose of percarine insufficient for analgesia is said to be able to cause complete vasodilatation.⁴⁵

The *segmental peridural method of Dogliotti*⁴⁶ is supported by a French writer who has employed it with great satisfaction. He has devised a means of rendering the exact depth of the needle easily visible, thus overcoming the chief drawback of the method, its technical difficulty.

Experimental work on the cadaver⁴⁷ supports certain conclusions arrived at from clinical experience. These are, chiefly, that height of anæsthesia depends mostly on the concentration but also to some extent on the amount of solution injected, that fall of blood-pressure is chiefly caused by paralysis of vasoconstrictor fibres, secondarily by paralysis of respiratory muscles, and that lowering the head is a measure of safety, while respiratory depression is the outstanding danger of spinal analgesia.

Pannett believes⁴⁸ that the distribution of the anæsthetic agent is largely influenced by the pulsation of the extradural vessels, and that the drop in blood-pressure is largely due to the dilatation of vessels in the muscles of the affected area of the body. He recommends raising the lower part of the body but not lowering the head.

Spinal analgesia is recommended⁴⁹ for *thoracic surgery*, the patient being given morphia and a barbiturate an hour before.

Quarella⁵⁰ attributes the advantages of *percarine* to the short time that it retains its activity when introduced into the spinal canal. He advises the use of concentrated solution, injected in the sitting posture, the patient being lowered soon after.

Metycaine,⁵¹ previously known as neothessin, has given the author results as satisfactory as those he obtained with novocain. The dose of 100 mgrm. corresponds to that of 120 to 150 mgrm. of novocain when it is given in the same way.

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ANEURYSM. (See also BLOOD-VESSELS, SURGERY OF; INTRACRANIAL ANEURYSM.) Sir W. I. de C. Wheeler, F.R.C.S.I.

Under this heading D. C. Elkin and J. L. Campbell¹ review a group of cases including true arterial dilatation, pulsating hæmatoma, and the arteriovenous fistula.

True Aneurysm.—No operation was attempted in the case of aneurysm of the thoracic and abdominal aorta. [Several successful cases of the latter operated on by the introduction of Colt's wire and by ligation of the aorta have been referred to in previous numbers of the MEDICAL ANNUAL.]

Twenty cases of spontaneous aneurysm are mentioned. There was no trauma and in 14 cases the Wassermann reaction was positive. [The reviewer has found the Wassermann reaction negative in several recent cases in his own experience, and in the experience of other surgeons.] At the time of operation there were several cases in which the aneurysm had ruptured into the surrounding tissues, and both true and false aneurysms were simultaneously found. The rupture was always accompanied by pain and was usually the reason why the patients sought hospital care. The most difficult problem was encountered in aneurysm of the common carotid artery. Ligation of this vessel is likely to produce hemiplegia. It is here that the fascial band for the

purpose of slowing the blood-stream and producing clotting in the sac has its best field. Five cases were treated by placing a band of fascia about 1.5 cm. wide just below the lesion and suturing it with silk. It was placed tightly enough to obliterate all but the slightest pulsation. Three of the patients recovered without complications. In one case there was a recurrence after five months, which was treated by proximal and distal ligation. Another patient developed a transient hemiplegia, but he finally made a complete recovery.

Aneurysms of the vessels of the extremities do not present the same difficulty of collateral circulation as do those of the carotid. Danger of gangrene exists, but the presence of the aneurysm and the slowing of blood through a main vessel is in itself a stimulus to collateral circulation. In doubtful cases the old Dublin method of digital compression may be employed with advantage in order to establish the collateral circulation before operative measures are adopted. One difficulty in the treatment of aneurysm of the lower extremities is that the sac is so friable and devitalized by pressure that obliterating sutures tear out the wall. In several instances, after opening the sac, evacuating all blood and clots, and suturing each opening, the sac has been packed loosely with vaseline gauze. This is removed and replaced daily and the wound irrigated with saline solution. The wounds healed rapidly and there was no case of secondary hemorrhage.

[It must be recollected that there are more simple and effective methods of dealing with aneurysm of the extremities. The reviewer obtained an excellent result in a very unfavourable case of popliteal aneurysm (*MEDICAL ANNUAL*, 1932, p. 23) after resection of a segment of the femoral artery above the aneurysm, and ligation of the femoral vein. The resection provided a radical form of sympathectomy, which resulted in vasodilatation in the collateral vessels below. To avoid temporary vasoconstriction the adventitious sheath of the femoral artery proximal and distal to the points of resection was injected with alcohol after the operation. Previous heart fibrillation ceased and the blood-pressure fell from 220 systolic to 180. Arteriotomy instead of ligation has much to recommend it.—W. I. de C. W.]

False Aneurysm.—Elkin and Campbell treated cases of false aneurysm by opening the sac under tourniquet control, evacuating the clot, and obliterating the sac by sutures. There were considerable technical difficulties found in the case of the subclavian artery.

Arteriovenous Fistula.—Sixteen instances of this condition are mentioned. It was most frequently met with in the carotid and femoral vessels. Early operation will frequently permit separation of the communication and closure of the wounds in the artery and vein. Collateral circulation is quickly established. Quadruple ligation and complete excision is the method of choice. This operation was successful in seven cases. Simple ligation without excision is sometimes futile. It is only by excision that all collateral vessels entering the fistula can be eliminated.

Mycotic Aneurysm of the Common Iliac Artery.—M. Gage² refers to this condition. Sympathetic ganglion block was employed as an aid to the development of the collateral circulation. It is mentioned that in 1883, Tufnell, of Dublin, described popliteal aneurysm developing in a patient with a proved active endocarditis. Two years previously Koek described an embolic aneurysm of the superior mesenteric artery from a similar cause. The signs and symptoms of embolic aneurysm are fully described in this paper. Gage suggests that the condition should always be kept in mind when patients suffering from endocarditis come under observation.

REFERENCES.—¹*Amer. Jour. Surg.* 1934, June, 611; ²*Ibid.* 667.

ANGINA, AGRANULOCYTIC. (See BLOOD DISEASES.)

ANGINA PECTORIS. (See also HEART FAILURE, THYROIDECTOMY IN; THYROID AND PARATHYROID SURGERY.) *A. G. Gibson, M.D., F.R.C.P.*

J. Urioste and R. P. Blanco¹ record four patients with angina pectoris in whom *profuse sweating* occurred. The crises were either generalized or in the anterior portion of the neck and thorax. Accompanying the sweating was pallor, peripheral chilliness, tachycardia, and a sensation of distress. They were noticed following effort, digestion, emotion, or in the night. The view of the authors is that they have the same prognostic significance as the attacks of pain.

P. D. White and T. Sharber² attempt to answer the question whether *tobacco and alcohol* play any part in the production of angina pectoris, and have made a statistical inquiry into 750 consecutive private patients with angina pectoris, together with a control series of 750 persons without angina pectoris but from the same walks of life. From this study it would appear that neither the use of, nor the abstinence from, tobacco or alcohol plays any important part in the genesis of angina pectoris. In certain individuals, however, the use of tobacco apparently aggravates or precipitates the attacks in angina pectoris, and alcohol in occasional patients helps to prevent or relieve the attacks.

M. K. Gray³ records four cases of angina pectoris in which an *electrocardiogram* has been taken during an attack. In all four cases changes have been evident in the ventricular complex which resemble those produced by coronary thrombosis. All of the patients had a high maximum blood-pressure though in one only was the minimum also raised. (See also ELECTROCARDIOGRAPHY.)

C. Hoyle and W. Evans⁴ determined the effect of *rest in bed* on a series of 23 patients with angina pectoris whose average age was 56. Recent coronary thrombosis was excluded. The rest consisted in being in bed in a general ward of the hospital for at least one month. Everything except slight voluntary movements was discouraged. Anginal attacks were relieved by nitrite. During the fifth week the patients were allowed up for short intervals. In the sixth the patients were up for four to six hours and were allowed to walk quietly. In the seventh week they walked measured distances in the hospital grounds. Subsequent improvement was seen in 17 out of the 23 patients: 7 of these showed great improvement and 10 slight. This improvement continued for periods of from four to nine months. The attacks were diminished in severity and duration, but they were never abolished. Two only of the 13 patients who had a normal blood-pressure, and 5 out of the 10 patients with hypertension, showed great improvement.

The same authors,⁵ in observing 122 patients with angina of effort over a period of three years, have found that the vasodilator drugs are the most efficacious in reducing the number and the severity of the attacks. Of these drugs, *glyceryl trinitrate* (trinitroglycerin) in doses of $\frac{1}{100}$ to $\frac{1}{25}$ gr. in tablet form is the best. It should be chewed slowly and not swallowed: 86 per cent of patients were greatly relieved. Other preparations of glyceryl trinitrate, and other vasodilator remedies, such as amyl nitrite, sodium nitrite, brandy, chloroform, carminatives, or hypnotics, do not give such good results. Amyl nitrite is recommended for those cases in which glyceryl trinitrate fails to relieve. No harmful effects were found in any patient, though the drug was used freely in some cases for upwards of two to three years. This treatment enabled the patients to take some physical exertion and lead a fuller life than had been possible before.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1934, cii, June 2, 1892; ²*Ibid.* March 3, 655; ³*Brit. Med. Jour.* 1934, i, May 12, 847; ⁴*Lancet*, 1934, i, March 17, 563; ⁵*Quart. Jour. Med.* 1934, N.S. iii, Jan., 105.

ANKYLOSTOMIASIS.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

DISTRIBUTION AND PROPHYLAXIS.—Ankylostomiasis in Porto Rico is dealt with by B. K. Ashford¹ and others, who record a group of six cases of acute infections through bathing near the outlet of an infested stream, with resulting ground-itch, weakness, anaemia, diarrhoea, slight fever, and eosinophilia within a few weeks, which they attribute to the larvæ wandering and dying in the tissues, so consider it "the larval phase of uncinariasis". In two of the cases 1439 and 614 ancylostomes were removed by treatment, and in the remaining four only from 125 to 7; three transfusions of blood were required in the worst case before anthelmintics could be given. Hookworm disease in the island of Nauru in Oceania is dealt with by A. M. B. Grant,² where the infections were twice as numerous around the damp shores of a central lagoon as on the drier foreshore. The construction of deep pit latrines and the treatment of the infected with a mixture of carbon tetrachloride and oil of chenopodium reduced the cases to one only.

TREATMENT.—*Tetrachlorethylene* has been further investigated by P. A. Maplestone, A. K. Mukkerji, and R. N. Chopra,³ who found the drug to be much less toxic to cats than carbon tetrachloride and harmless in therapeutic doses; it can be given safely in alcohol. They have also tested the drug clinically in 50 hospital cases, with cure in 62 per cent with one treatment, and 12 per cent more with a second one, without any severe symptoms and no constant or significant change in the pulse and respiratory rates. They mixed 2 oz. of saturated magnesium sulphate with 4 c.c. of tetrachlorethylene and 1 c.c. of oil of chenopodium in a small bottle, shook to form a fine emulsion, and gave the dose immediately. A similar mixture containing 3 c.c. of carbon tetrachloride did not give quite as good results, and the cost per dose differs but little, for it is but one halfpenny. The literature on the toxicity of carbon tetrachloride and allied compounds is dealt with at length by J. W. Tombs and M. M. Helmy,⁴ who agree with others regarding their toxic effects on the liver.

Iron treatment of ankylostomiasis anaemia is reported on by A. G. Biggam and P. Ghalioungui⁵ working in Cairo. They studied blood regeneration and obtained a reticulocyte response and an increase in haemoglobin and red corpuscles after oral administration of reduced iron, Bland's pill, and ferrous chloride, even in patients still harbouring ancylostomes. Intravenously in the form of injectio ferri (B.P.) it did not give satisfactory results, but it was sometimes effective intramuscularly. Attention may also be drawn to a discussion on the regeneration of red corpuscles at the Royal Society of Tropical Medicine.⁶

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, Sept. 9, 843; ²*Med. Jour. Australia*, 1933, June 17, 783; ³*Ind. Med. Gaz.* 1933, Oct., 554, Nov., 617; ⁴*Jour. Trop. Med. and Hyg.* 1933, 265, 334; ⁵*Lancet*, 1934, Aug. 11, 299; ⁶*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, May 9, 529.

ANTHRACOSIS. (See PNEUMONOCOINOSIS.)**ANUS, DISEASES OF.** (See RECTUM AND ANUS.)**APPENDICITIS.***A. Rendle Short, M.D., F.R.C.S.*

The Campaign in America.—As we have remarked in previous years, the heavy mortality from appendicitis in the United States has led to campaigns of education in the hope of securing earlier and better treatment. For instance, in some towns the high-school children were all presented with 'stickers' to place in a book they use daily, warning them to seek hospital

treatment early and avoid aperients if they suffered from acute abdominal pain. The deaths in Philadelphia have been brought down from 306 in 1928 to 122 in 1932, and the mortality from 6 per cent to 3.44 per cent (J. O. Bower¹).

DIAGNOSIS.—Of late years it has come to be recognized that rheumatic fever may produce a very close mimicry of acute appendicitis, and a certain number of unnecessary operations have been performed. According to P. Guptill,² of Rochester, New York, four cases of rheumatism were operated on in his hospital on a wrong diagnosis of appendicitis and in four other cases suspicion was aroused. He says that pain and fever are present in both, but the children with rheumatism do not vomit, show little or no muscular guarding, and have a normal Schilling differential leucocyte count. The pulse may be unduly quick, and swelling and pain in the joints may be present.

M. J. Pervès,³ of the French Naval Service, complains that a soldier or sailor on the eve of departure for a remote foreign station will frequently present himself to be 'disembarrassed' of his appendix. As he says, one can scarcely let a genuine case go perhaps far from all surgical help, but "il est peut-être excessif d'opérer systématiquement tout le monde"! To sift the true from the trivial, he uses an intradermic *B. coli* reaction. This is a colon-bacillus exotoxin filtered and diluted, prepared by Vincent, of Paris. A 10-c.c. inoculation may give little or no reaction, or a dusky red papule may be produced. In 100 cases operated on for appendicitis, of 81 with a pathological appendix, 53 gave a positive reaction, and in the other 28 the culture showed other germs, or the trouble was due to chronic fibrosis. In the 19 patients explored with negative results, the test gave 6 positives and 13 negatives. It appears therefore that the reaction, though by no means infallible, is quite useful as demonstrating whether an active *B. coli* infection is present or not.

Appendicitis past Forty.—U. Macs, F. Boyce, and E. M. McFetridge,⁴ of New Orleans, maintain that an attack in a patient past forty is quite a different proposition from that of appendicitis in young adults. In a considerable number the symptoms and course are entirely atypical, suggesting anything rather than appendicular disease. There is often a history of prolonged abdominal discomfort followed by acute mid-abdominal pain, with little or no rise of temperature; the symptoms may or may not settle down in the right iliac fossa, but the pulse-rate rises. Usually the patient doses himself with a purgative, and if it is vomited he takes another. Then the pain ceases, but the symptoms of diffuse peritonitis, or of paralytic ileus, make their appearance. Of 100 cases seen and operated upon, 21 died; enterostomy was thought necessary in as many as 35. Pulmonary and other complications were frequent. [Every surgeon of experience can recall many cases entirely bearing out the authors' conclusions.—A. R. S.]

The Delayed Operation in Acute Appendicitis.—Controversy continues on the rights and wrongs of delaying operation in patients seen late in the attack. H. C. W. Nuttall,⁵ of Liverpool, writing on "The Fallacy of Expectant Treatment in Acute Appendicitis", basing his observations on 551 cases operated on with a mortality of 2.5 per cent, maintains that deaths are mostly amongst children and the aged, and that for these the delayed operation is not suitable. The delay is vexatious to the patient, who wants to be back at work as soon as possible, and to the hospital, which cannot spare beds for two periods of illness for the same patient. Immediate operation in all stages is recommended, but that does not always mean appendicectomy; in late cases drainage is often better.

J. M. Melly,⁶ of Ann Arbor, says that the lowest mortality ever published in cases with diffuse peritonitis is that of 1.6 per cent, obtained by Le Grand

Query, using Ochsner's method of delayed treatment. The usual mortality after operation is 20 per cent. In Melly's series, under delayed treatment, the death-rate in cases of appendicitis with diffusing and diffuse peritonitis was 4.3 per cent, whereas it used to be 21 per cent on the older principle of immediate appendicectomy.

Technique.—E. Sherman Jones,⁷ of Hammond, Indiana, has for ten years performed an appendicostomy in all cases of acute appendicitis in which perforation has occurred, with local or diffuse peritonitis; of 75 patients so treated, only 1 died. By this means not only is the appendix exteriorized and further leakage prevented, but the cæcum is drained and evacuation of the contents of the small intestine through the ileocaecal sphincter assisted. If necessary, water and chlorides can be introduced through the tube. The appendix is removed in the usual way and buried by a purse-string suture, but with a catheter or rubber tube inserted, and packed round with omentum to prevent adhesions and to avoid leakage of faeces when the tube is removed.

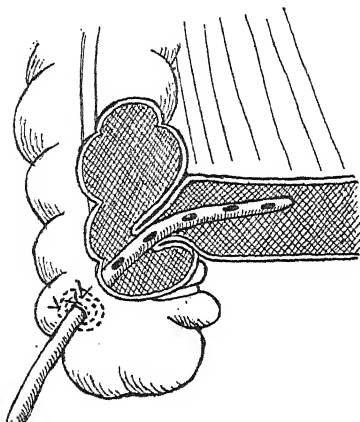


Fig. 4.—Cæcostomy with ileum drainage.
(Reproduced from 'Surgery, Gynecology
and Obstetrics'.)

The tube is brought out through a stab-drain. It is left open to let off gas for a few hours at a time, and then used to introduce 2 to 5 per cent saline, 200 to 300 c.c. at a time, the tube being clamped for twenty minutes afterwards to retain it. Nothing is to be given by mouth for two days or longer. The tube is removed after a week and the opening will not leak. [Small drains in the cæcum seldom let off either gas or faeces, but no doubt this is a useful way to introduce fluids.

—A. R. S.]

The value of a cæcostomy or enterostomy done as a primary operation when the appendix is removed in a certain number of cases complicated with local or general peritonitis is emphasized by E. R. Easton and W. J. Watson,⁸ of New York. If the cæcum is drained, which it should be if greatly distended,

they use a tube with lateral holes and pass the tip on through the sphincter into the ileum (Fig. 4). They criticize appendicostomy on the ground that the base of the appendix and the cæcum around it are probably inflamed and infected. If the small intestine is paralysed and dilated, jejunostomy or ileostomy is indicated.

Control of Paralytic Ileus.—This, the most dreaded, complication following operation for appendicitis, is combated in P. C. Potter's⁹ clinic, in New York, by the regular administration of *pitressin*, which is pituitary extract minus the oxytocic factor. One ampoule is injected intramuscularly before operation, and every four hours afterwards; eight to twelve doses altogether were given, and paralytic ileus did not occur. 'Pituitary shock' was never observed. In the presence of pneumonia, the effect is evanescent, and the injection must be given two-hourly. No purgatives or enemata are ordered until the *pitressin* has been discontinued unless abdominal distension is present.

REFERENCES.—¹Jour. Amer. Med. Assoc. 1934, March, 813; ²Ann. of Surg. 1934, April, 650; ³Bull. et Mém. Soc. nat. de Chir. 1933, Dec., 1447; ⁴Amer. Jour. Surg. 1934, Jan., 157; ⁵Brit. Jour. Surg. 1934, Jan., 411; ⁶Practitioner, 1933, Nov., 569; ⁷Ann. of Surg. 1934, April, 640; ⁸Surg. Gynecol. and Obst. 1934, April, 762; ⁹Ann. of Surg. 1934, Jan., 985.

ARRHYTHMIAS. (*See also HEART DISEASE, ETC.*)*A. G. Gibson, M.D., F.R.C.P.*

Paroxysmal Tachycardia.—Some cases of paroxysmal tachycardia show a regularity of rhythm, others an irregularity. A. U. Mackinnon¹ has examined a series and compared the records with others reported in medical literature; he comes to the conclusion that, when the origin of the tachycardia is ventricular, regularity of rhythm is more usual, while in auricular paroxysmal tachycardia the rhythm may be irregular to an extent which can be detected by clinical examination. Very occasionally irregularity is seen in paroxysmal ventricular tachycardia from disturbances in ventricular conduction, from feebleness or irregularity in the origin of the focal stimuli or from stimuli arising from one or more foci.

Bundle Branch Block.—M. Campbell and S. S. Suzman² record the disappearance of bundle branch block and gallop rhythm simultaneously in a man aged 50 who had had syphilis but whose Wassermann reaction was negative. He was the subject also of hyperpiesis. They infer that there may have been a small coronary thrombosis of which bundle branch block and gallop rhythm were a temporary result.

J. T. King³ records his observations in 155 cases of bundle branch block. His general conclusions are similar to those in other series—namely, that it is associated mainly with degenerative heart disease, though a smaller number are found in syphilitic and rheumatic infections of the heart. One point that emerges is that labourers are more prone to develop bundle branch block than are professional men or women engaged in household duties. The condition is more common in men than in women. It is the second most frequent disorder of the cardiac mechanism, the most frequent being auricular fibrillation.

J. K. Lewis⁴ records 20 patients with bundle branch block, especially as to the heart-sounds and the apex cardiogram. A presystolic gallop rhythm was present in 9, and in 3 of these a presystolic impulse was associated with the presystolic sound. In one case only was the impulse present alone. Presystolic gallop rhythm in these patients is the same as that found in patients without bundle branch block, and its presence in bundle branch block can be accounted for by the fact that both these conditions occur in the same general type of heart disease. The incidence of gallop rhythm in the group under consideration was higher than in an unselected group of patients with degenerative heart disease. The author concludes that the physical signs are not such as can be used for a diagnosis of bundle branch block.

Paroxysmal Fibrillation.—D. Hall⁵ records the clinical history of a patient with paroxysmal fibrillation from which he had suffered for a period of twenty-nine years so far as he was able to identify it. He was a naval officer and had suffered from Mediterranean fever and rheumatism in 1893–4 and had had prolonged attacks of malaria over a period of two years, dating from 1897, when he had been in West Africa. In 1901 he had had a severe heart attack after playing football. During the War he had an attack of fibrillation which lasted two months. In 1924 he had cholecystectomy. The attack for which he was seen in 1930 at the age of 56 was brought on by playing four holes of golf 5000 feet above sea level. He habitually disregarded the paroxysms, and he had found that an invariable cure was salmon fishing, and that a paroxysm stopped at once when he got fast in a fish. Quinidine produced only a temporary effect, and he found benefit from digitalis. There was no indication in the history of its relation to any of the diseases from which he had suffered which might have produced changes in the cardiac muscle. It would appear to belong to that type of fibrillation of which very

occasional examples are seen following shock, and it would seem to have no relation to the lesions of the muscle. Three cases were discussed by J. G. Emanuel in his Ingleby Lectures in 1926.

REFERENCES.—¹*Quart. Jour. Med.* 1934, N.S. iii, Jan., 1; ²*Lancet*, 1932, May 7, 985; ³*Amer. Jour. Med. Sci.* 1934, clxxxvii, Feb., 149; ⁴*Arch. of Internal Med.* 1934, liii, May, 741; ⁵*Med. Forum*, 1933, i, 321.

ARTHRITIS, CHRONIC. (See RHEUMATIC DISORDERS, CHRONIC.)

ASTHMA AND HAY FEVER. J. F. Gaskell, M.A., M.D., F.R.C.P.

ASTHMA.

Clinical Data in Asthma.—The formation of asthma clinics in many hospitals has allowed a much more comprehensive view of the condition to be obtained. A critical survey of 500 patients who have attended the Asthma Clinic at Guy's Hospital has been made by L. J. Witts.¹ His observations extended over a period of four years, and at the same time 100 others with no symptoms of asthma or allied diseases have been investigated as controls.

Asthma paroxysms are characteristic and diagnostic. The sputum is also a characteristic and cardinal feature of the condition; it contains small bronchial plugs best seen against a dark background; these plugs are only occasionally of the spiral type. Under the microscope eosinophil cells are present in the majority of these plugs unless replaced by pus cells owing to bronchial infection. The response to adrenalin in small doses up to 5 minims is constant and specific. An eosinophil leucocytosis is usually present in the blood in the active stage of the condition. Other allergic symptoms occurred in 40 per cent of the cases. A family history was present in 60 per cent, but the control group also supplied individuals with an asthmatic family history. Skin reactions to proteins were present in 40 per cent, using the scratch test; their frequency was more closely related to the age of the patient when asthma first occurred than to the age at the time of testing. They may also be present in healthy people with no allergic signs. Bruce Pearson has found 20 per cent of normal people positive. Witts does not consider that there is any clinical difference between the asthmatics who are protein-sensitive and those who are protein-insensitive. The division into hereditary asthma and acquired bronchitic asthma is not tenable. Three patients died in status asthmaticus; all had negative skin tests and no family history of the disease; this is difficult to reconcile with the theory that asthma is an hereditary allergic dystrophy.

Witts has also studied the relationship of asthma to other diseases in his group. The incidence of both tuberculosis and rheumatism was lower than normal. The figures for diseases of the alimentary tract were also very low. With regard to hypochlorhydria, fractional test-meals showed no departure from the normal in adults. He considers the achlorhydria of asthmatic infants to be due to an allergic gastritis, an eczema of the stomach. Morbid conditions of the upper respiratory tract do appear to be intimately linked with asthma, but surgical procedures give only temporary relief, and they are only justifiable when they would have been done if the patient was not an asthmatic. Fifteen per cent of his series had been operated on, the failure of the treatment being demonstrated by their return to the Clinic. As regards the clinical evidence of asthma, these patients differed in no way from the rest, giving no support to the view that there is a special type of nasal asthma.

Lower respiratory tract disease becomes more evident the longer the asthmatic condition lasts; asthma becomes more and more respiratory as the

years go by. With regard to its association with acute lung disease, 30 per cent gave such a history, pneumonia being the most common form; there was no difference in skin sensitivity in those who had had pneumonia and those who had not. In almost all cases acute respiratory disease did not precede but followed the first symptoms of asthma. Hereditary factors were as common in those with lung complications as in those without. Acute lung disease cannot, therefore, be considered the cause of asthma; though local tissue damage may be the deciding factor between latent and manifest allergy. Blood-pressure was if anything below the normal; the association with hyperpiesia is fortuitous. Disease of the urogenital tract, endocrine glands, and organic disease of the nervous system are not more common in asthmatics. Witts concludes that asthma is a clinical entity, and that there is no justification for subdivision into types.

X-ray Examination of Asthmatics.—J. B. Christopherson² pleads for closer anatomical study of the lungs and bronchi in bronchial asthma and bronchitis. He considers lipiodol a most valuable adjunct to this study. He has studied 200 cases, and in only a small percentage found no alteration of the bronchial tubes; nearly all showed varicose, beaded, or fusiform dilatation. He considers this due to relaxation of the bronchial muscle—that is to say, an exaggeration of the inspiratory phase. He describes the X-ray appearances in four groups—chronic bronchitis, bronchial asthma, asthmatic bronchitis, and bronchitis with emphysema—and claims typical changes characteristic of each group. He considers that in all of these there is sympathetic nerve over-action.

Relation of the Adrenalin Content of the Blood to Asthma.—J. H. Burns³ puts forward the hypothesis that the predisposing cause of asthma is a low adrenalin content of the blood: so that patients with asthma become unable to dilate the bronchiolar air-way when chronic infections cause a constriction of them. This is based on experimental evidence of the inter-action of adrenalin with other drugs in cats. The suddenness of the clinical attack and the complete absence of bacterial infection in many cases makes this theory of doubtful value.

Urinary Proteose in Asthmatic Conditions.—G. H. Oriol⁴ records further observations on urinary proteose. He claims chemical differences between normal and asthmatic proteose as well as differences of skin reaction with proteose in asthma patients when active and quiescent. Asthmatic proteose can be separated into three fractions, normal remains in one only. He claims great improvement by proteose inoculation in a series of protein-sensitive asthmatics. Others who are non-protein-sensitive are not benefited by it.

Allergen-free Chamber.—P. Habetin⁵ describes the structure and value of a special allergen-free chamber which has been constructed in the Wiener Neustadt Krankenhaus. At a height of 7 to 10 metres above the roofs of houses the air is allergen-free. This principle is used by the ventilation of the room with air collected at the top of a tower of sufficient height, warmed, and brought into the room by a closed ventilation system. He gives the results of treatment in this room of cases of 'climate asthmatics', by which term Storm van Leeuwen has designated cases whose attacks depend not only on the atmospheric conditions but also on the geological conditions, together with the presence of organic allergic substances derived from animal or plant micro-organisms. These cases can be divided into those sensitive to house allergens and those sensitive to open-air allergens. Similar special allergen-free chambers have been used with success in hay fever for some years. Habetin treated 22 severe cases, of whom 20 were freed from attacks, but 2 were refractory. Skin tests to Storm van Leeuwen's extracts were positive in a very high

percentage of these cases. The chamber is of value to confirm the diagnosis of 'climate asthma', and for therapy by treating in it very severe cases and status asthmaticus, by facilitating anti-allergic treatment in a free atmosphere, and to settle whether a similar chamber is advisable in the patient's own house.

Ephedrine and Pseudo-ephedrine.—The treatment of asthma by special drugs has been studied by various observers. The Therapeutics Trial Committee of the Medical Research Council have instituted inquiries into the relative values of pseudo-ephedrine and ephedrine.

J. B. Christopherson and M. Broadbent⁶ tested these drugs in 24 cases of spasmodic asthma without bronchitis and in 37 cases of bronchial asthma. The drugs were given in tablet form in successive periods with intervals in which inert tablets only were used. The doses were from $\frac{1}{4}$ to 2 gr. at bedtime and if necessary another dose during the day. Both relieved attacks of spasmodic asthma, but pseudo-ephedrine was less effective than ephedrine, the dose of pseudo-ephedrine being roughly double that of ephedrine to produce the same effect. Four cases with wheezing and dyspnoea only were entirely relieved by taking pseudo-ephedrine every night. In the bronchial asthma group, 8 were relieved of chronic dyspnoea but not helped in the acute attacks; in 9 relief was also obtained in slight attacks; 20 had no severe attacks, and in 15 of these wheezing and dyspnoea were relieved. Pseudo-ephedrine is therefore useful for the minor manifestations, but cannot replace ephedrine in the severe attacks.

Toxic effects such as palpitation, insomnia, and other disturbances occurred with both, but the authors found different sensitiveness in different individuals. Out of 61 asthmatics, 32 were hypersensitive to ephedrine in doses ranging between $\frac{1}{4}$ gr. and 1 gr., and 16 were hypersensitive to pseudo-ephedrine with similar doses. Only 13 were hypersensitive to both. Pseudo-ephedrine is, therefore, a useful substitute in certain cases.

These authors also studied the effects of the drugs in nocturnal enuresis in children, and found both of great value. Neither showed any signs of the reputed diuretic effect claimed for ephedrine.

G. W. Bray and L. J. Witts⁷ make a similar report. They find the same toxic effects in both drugs that Christopherson and Broadbent find. They hold that ephedrine is of little value in very severe attacks of asthma. They tested the two substances in two ways: with regard to their power to diminish the number of attacks by continuous administration, and with regard to their value in acute attacks. Twenty children, aged 4 to 9, were divided into groups of five and treated alternatively for varying periods with ephedrine and pseudo-ephedrine and inert sugar and water over a period of one year. The authors found a ratio of attacks in controls, ephedrine periods, and pseudo-ephedrine periods as 100 to 107 to 73. Attacks were, however, less severe in the ephedrine periods and still less in the pseudo-ephedrine periods. They found sensitivities in certain cases to one or the other drug, most commonly to ephedrine. The effect on the acute attacks was tested at Guy's Asthma Research Clinic. A $\frac{1}{2}$ -gr. tablet of ephedrine hydrochloride was taken as early as possible in the attack and followed by two more doses at hourly intervals. Of 60 adult patients, 28 were relieved by ephedrine without toxic effect, 23 were relieved but suffered toxic symptoms, 7 were unable to take it, and in 2 it had no effect. Pseudo-ephedrine was given similarly in 1-gr. doses to a group of 21 adults whose reactions to ephedrine were known, 15 being relieved by the latter with moderate toxic symptoms; 6 could not tolerate it. With pseudo-ephedrine only 3 obtained relief with moderate toxic symptoms, 6 were unaffected, and 5 had slight relief with no toxic symptoms; 7 had toxic symptoms and less relief than with ephedrine. Only 4 preferred pseudo-ephedrine

to ephedrine, and only 1 out of the group intolerant to ephedrine was relieved by pseudo-ephedrine. In another group of 10 cases 3 had had relief by ephedrine and the other 7 had not been treated by either drug. Pseudo-ephedrine relieved 4 without toxic symptoms, 2 were slightly relieved but had toxic symptoms, 2 were unaffected, and 2 had toxic symptoms without relief. Their conclusion is that pseudo-ephedrine is indicated to lessen the frequency and severity of attacks in children, but is much less efficacious in the paroxysms of adults, where it should only be tried in cases of intolerance to ephedrine—results which are in accord with those of Christopherson and Broadbent.

Isalon.—Another substitute for ephedrine has been studied by H. Handovsky and E. Kubeja.⁸ It has been named 'isalon', and has been produced by J. Wiernik & Co. It has not the effect on the blood-pressure that ephedrine has, hardly raising it at all; it has, however, a very good action on the bronchial muscles.

In the dog isalon causes dilatation of the peripheral blood-vessels and at the same time stimulates the vasomotor centre, thus bringing about a fall of blood-pressure with the same dosage that produces a rise with ephedrine. There are two groups of substances causing bronchial dilatation, bronchodilator, when low tonus is present, and spasmolytic, when high tonus is present. In asthma the tonus is high, so spasmolytic drugs are wanted. Experimentally ephedrine belongs to the bronchodilator group, isalon to the spasmolytic. This was proved by transfusion experiments with increasing doses of pilocarpine in Tyrode solution, thus raising the tone of the bronchial muscle more and more. The effect of ephedrine disappeared, but that of isalon became stronger. As tested on mice, isalon is found to be only half as toxic as ephedrine.

Isalon was tried on 60 cases, 0.09 gm. being given in tablet form three times daily during attacks, and half this dose being given during quiescent periods. In almost all cases acute attacks quickly subsided, and after a short treatment the chronic dyspnoea disappeared. The drug had no observable effect on blood-pressure or pulse-rate. There were no toxic symptoms. Of the 60 cases treated, 22 were cured, 28 much relieved, attacks becoming less frequent and less severe; 10 did not respond. Isalon is therefore a valuable weapon in the treatment of asthma, being especially suitable for those cases that have circulatory disturbances.

Benzinol—benzine and aliphatic carbohydrates in olive oil—is advocated by J. Kairukstis.⁹ It is given intramuscularly in a single dose. The correct dosage is most important: 0.4 gm. should be given. Following the injection improvement may go on to complete freedom from symptoms. Too early repetition of the dose destroys the effect. There are refractory cases, some of which can be improved by giving a second larger dose. Active tuberculosis is a contra-indication. The injection often gives temporary reactions, but the only lasting one is pain at the site of the injection, which can be relieved by injecting tutocaine. An abscess is never formed.

Intramucous Autoserotherapy.—A. Jacquelin and G. Bonnet¹⁰ advocate intramucous autoserotherapy in a definite group of asthmatics: 10 c.c. of blood are clotted, the clot is removed, and the serum is injected into the mucosa of the nose. They divide asthmatics into three groups: (1) Those due to specific sensitization, relieved by autohæmotherapy; (2) Non-specific cases due to autotoxic products of deficiencies of nutrition, relieved by autoserotherapy; (3) Those due to nervous causes insensible to either treatment. They find 30 per cent belong to group (1), 45 per cent to group (2), and 25 per cent to group (3). Autoserotherapy is thus valuable in the largest group.

Acid-base Equilibrium in Asthma.—M. Szour¹¹ has studied the acid-base equilibrium in asthma from the point of view of dietetics in this disease. He

finds the variations from the normal not constant even in one individual. The acidifying diet of Tiefensee and similar diets are not justified. In fact the employment of this or that régime is of little importance in asthma.

Calcium Balance in Asthma.—This subject has been examined anew by A. Drillhon, R. Clogne, J. Galup, and T. Debidour.¹² They collected blood from severe cases, sometimes actually in the acute attack, and found hypercalcaemia, in direct contradiction to the hypocalcaemia found by various others. Asphyxia may in part account for this, but not altogether.

Diagnostic Extracts.—P. Molinari-Tosatti¹³ describes in detail the methods used for the preparation of diagnostic extracts in the University Clinic in Rome. They are mostly made in decinormal soda solutions.

HAY FEVER.

Perennial Treatment.—Aaron Brown¹⁴ advocates perennial treatment of hay fever rather than pre-seasonal or seasonal. He also considers dosage should be carefully measured according to the sensibility of the patient. He finds wide differences in the latter, and groups his patients accordingly. Hay fever affects about 1 per cent of the population of the United States of America and is most frequent between the ages of 20 and 40. There are two factors—an inherited predisposition and an exciting cause, the pollens. The tendency is a Mendelian dominant, and the stronger the tendency, the earlier the age of appearance of symptoms. The pollens are the wind-borne ones. In the New York region there are three types: (1) The spring type due to the pollens of trees; (2) The summer type due to grass pollens; (3) The autumn type due principally to ragweeds. The author prefers the intradermal skin test for sensitivity. His solutions are standardized by their total nitrogen content. He classifies patients into groups by the lowest dilution giving marked reactions, the range of each being ten times that of the one below it. His doses also vary similarly, for he holds that the more sensitive the patient, the less antigen is needed to protect. Treatment was pre-seasonal in most cases, beginning two or three months before the expected onset, injections being given in increasing doses at five- to seven-day intervals up to the maximum for the class. This maximum dose is repeated weekly throughout the season. Some cases have been treated perennially, throughout the whole year. After the season is over, doses are repeated at intervals increasing from ten days to four weeks. Brown's results with this are better than with pre-seasonal treatment, and he hopes it may give a permanent cure in time. The difficulty is to keep up the potency of the extract, but this has been overcome by the use of glycerinated extracts, which keep their potency for years. Perennial treatment can be begun at any time of the year, and thus relieves the pressure in the pre-seasonal period. Pre-seasonal treatment gives 85 per cent relief in 85 per cent of cases. The results of perennial treatment are even better.

Method of High-Dosage Desensitization.—D. Harley,¹⁵ on the other hand, advocates the gradual raising of the dosage up to a very high figure. He has studied the mechanism of desensitization by the use of the prick method introduced by Lewis, a single prick being made through a drop of solution placed on the skin. He considers this a much more exact method than the scratch or intradermal, as the damage to the skin is minimal. No doubtful reactions occur and the size of the weal is not dependent on the amount of damage. It is very rapid; results can be read in ten minutes. He used Timothy grass pollen at various dilutions and gave both pre-seasonal and seasonal treatments. He starts with 40 to 80 units and rises to a maximum of 100,000 units at the end of May. He gives diagrams showing that skin sensitivity is proportional to the 'reagin' content of the serum, by comparing

the size of weals in the patients caused by various doses of pollen with the size of the weals in normal people who have had their skin sensitized by the particular patient's serum. The prick method also demonstrates that sensitivity is finally abolished if a sufficiently high dose is reached. Doses of 5000 units only are indecisive. The serum reagin also ultimately disappears still later if treatment is continued. The disappearance of skin sensitivity signalized complete disappearance of all symptoms. General reactions occurred in only two cases notwithstanding the high dosage finally reached. Harley considers the skin reaction to be due to the liberation of histamine by a combination of reagin and extract, and gives a theory of the process of desensitization, from which he deduces that treatment pushed far enough should cause the total disappearance of reagin, and, anyway temporarily, a complete cure.

Special Respiratory Chambers.—C. Davies¹⁶ discusses the various essentials required in air filtration for the use of special pollen-free treatment chambers. He advocates cotton cellulose filters rather than wool, felt, or paper.

A. S. D'Eloia¹⁷ describes preliminary experiments in an attempt to desensitize by controlled artificially pollinated air. Six patients with autumn ragwort sensitivity were chosen, all reacting to the scratch test. The concentration of pollen in a special closed room could be increased well above that observed for the outside air without causing symptoms.

REFERENCES.—¹*Lancet*, 1934, Feb. 10, 275; ²*Amer. Jour. Med. Sci.* 1933, Oct., 504; ³*Proc. Roy. Soc. Med.* 1933, Nov., 31; ⁴*Lancet*, 1933, Aug. 19, 406; ⁵*Wien. klin. Woch.* 1934, xlvii, May 25, 651; ⁶*Brit. Med. Jour.* 1934, June 2, 978; ⁷*Lancet*, 1934, April 14, 788; ⁸*Munch. med. Woch.* 1934, March 2, 326; ⁹*Ibid.* 1933, Sept. 8, 401; ¹⁰*Presse méd.* 1934, Feb. 14, 249; ¹¹*Ibid.* 1933, Dec. 9, 1984; ¹²*Ibid.* 1934, May 19, 816; ¹³*Policlinico*, 1933, xl, Aug. 1, 489; ¹⁴*Med. Record*, 1934, cxxxix, June 6, 571; ¹⁵*Lancet*, 1933, Dec. 30, 1469; ¹⁶*Med. Record*, 1934, cxxxix, May 16, 544; ¹⁷*Ibid.* 1933, cxxxviii, Sept. 20, 181.

AUTOPHARMACOLOGY. (See PHARMACOLOGY AND THERAPEUTICS.)

BANTI'S DISEASE. (See BLOOD DISEASES.)

BED-SORES. (See PARAPLEGIA; SURGICAL TECHNIQUE.)

BERI-BERI AND EPIDEMIC DROPSY.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The cardiovascular changes in epidemic dropsy are dealt with once more (see MEDICAL ANNUAL, 1932, p. 64) at length by R. N. Chopra and S. C. Bose.¹ They regard the 'cardio-capillary crisis' as due to toxins in ingested rice, and still advise ephedrine in its treatment, together with calcium to decrease the permeability of the capillary walls. An editorial article² in the same journal refers to the differentiation of epidemic dropsy of rice-eating districts of India from beri-beri of Malaya in 1877 by McLeod, and emphasizes the absence in the former disease of the signs of peripheral neuritis that are so characteristic of beri-beri, and the constant presence in epidemic dropsy of gastro-intestinal irritation, a peculiar mottling of the skin, and hæmorrhages from mucous membranes, which are not seen in beri-beri, although the wet form resembles epidemic dropsy on account of the œdema present in both diseases. The well-known work of J. W. D. Megaw in showing the association between the consumption of badly stored rice and the sudden occurrence of a number of cases of epidemic dropsy, in a manner unlike a deficiency disease, is also pointed out, and the confirmation of the Calcutta workers by the report of Burnett on epidemic dropsy due to the consumption of old and badly stored rice in Sierra Leone is noted. [The reviewer regarded epidemic dropsy of Calcutta as different from beri-beri as early as 1902 in a paper in the *Indian Medical Gazette*.—L. R.]

REFERENCES.—¹*Ind. Med. Gaz.* 1933, Nov., 605; ²*Ibid.* 635.

BILE-PASSAGES, SURGERY OF. (*See GALL-BLADDER AND BILE-PASSAGES, SURGERY OF.*)

BILHARZIASIS. (*See BLADDER, SURGERY OF; SCHISTOSOMIASIS.*)

BIRTH INJURY OF THE OCCIPITAL BONE. (*See LABOUR AND ITS COMPLICATIONS.*)

BLADDER, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Presacral Neurectomy.—Presacral neurectomy for the relief of intractable bladder pain is a notable addition to the current therapeutic armamentarium. S. T. Kwan¹ reminds us that the operation is not difficult to perform and is not dangerous. He performed the operation in one patient suffering from painful cystitis of eleven years' duration. There was almost complete relief of symptoms and no deleterious effect on the mechanism of micturition. In another patient who had advanced tuberculosis of the bladder the constant pain and frequency of micturition were greatly relieved.

D. Whyte and P. A. Treahy² report a case of a patient suffering from intractable frequency and dysuria. The bladder was contracted and there was an ulcer involving the right ureteric orifice. The capacity of the bladder before operation was 90 c.c. Three weeks after the presacral nerve had been resected the capacity of the bladder was 390 c.c. and the patient was able to hold urine for four hours. Six weeks after operation the ulcer had healed, and eight months later the patient was entirely free from all symptoms.

A. A. McConnell³ divided the presacral nerve in three cases of intractable bladder pain, two of which were due to inoperable carcinoma. The effect of the operation was the same in all cases—an immediate sense of relief of pain and relative comfort. Pain and frequency then returned in five or six days, but the worst pain, a feeling of intolerant distension before micturition, and spasmodic contraction, were completely and permanently relieved. Section of the sympathetic nerves in no way interferes with micturition. Their removal helps emptying of the bladder (*MEDICAL ANNUAL*, 1934, p. 78). In order to relieve all pain from the bladder it would be necessary to cut the parasympathetic as well as the sympathetic, but retention of urine would result. Such an operation combined with permanent suprapubic cystostomy might be justifiable in cases of extreme bladder pain.

Rupture of the Bladder.—"No case of rupture of the bladder ever recovers", the despairing cry handed down from the ancients, was first disproved in 1839 by Dr. Walther, of Pittsburg. This courageous practitioner, defying his consultants, opened the abdomen of a young blacksmith two hours after an accident. The enterprise was crowned with success.

Traumatic rupture of the bladder is supremely and only remediable by operation, but the operation must be undertaken reasonably early. Herein lies the difficulty. The condition is rare, and, particularly in intraperitoneal rupture initial symptoms may be trivial. Most of us can recall cases where a beguiled clinician, having re-assured and sent the patient home, is later thunder-struck at the necropsy findings. Every large series of cases shows a high mortality. Doubtless this could be reduced if the profession made it an unwavering rule to keep a patient who has had an abdominal contusion under constant observation until he has passed an adequate amount of normal urine. Statistics show that when operation is performed within twelve hours the mortality is 11 per cent; when operation is delayed to twenty-four hours it is 55 per cent. Without operation, as in the days of ancient Greece, it is 100 per cent.

L. M. Bogart⁴ advises that after shock has been combated, instead of resorting to time-consuming diagnostic aids, an exploratory operation should be performed.

The Differential Diagnosis of Certain Bladder Symptoms.—When incontinence or, particularly, retention of urine occurs without an obvious local organic lesion R. Lichtenstern and O. Marburg⁵ exhort the practitioner to examine the central nervous system immediately. In not a few instances the first sign of disseminated sclerosis, tubes dorsalis, or even a cerebral or spinal tumour is interference with the function of micturition. Professor Mercier⁶ points out that symptoms of cystitis can be simulated by tubes dorsalis, a vesical calculus, a stone in the lower third of the ureter, hydronephrosis, or urethral caruncle.

Tuberculosis of the Bladder.—The treatment of established tuberculous cystitis is a difficult problem. The almost hourly frequency and intense pain which often accompany this condition have stimulated therapeutic effort, and many forms of treatment have been devised, among which may be mentioned: (1) Rovsing's treatment of irrigating the bladder with a 6 per cent solution of warm carbolic acid. (2) Hollander's method: Pot. iodide is given internally, and a few hours afterwards a calomel emulsion is instilled into the bladder. The mercuric iodide thus formed is analgesic and antiseptic. (3) Witzack's treatment, consisting of instillations of 20 per cent lactic acid.

B. E. Greenberg and M. L. Brodney⁷ have introduced a new form of therapy, and the results appear far better than those obtained by any of the above methods. Their method is as follows: (1) A preliminary course of methylene-blue pills in 2-gr. doses three times a day for three weeks. (2) The patient discontinues all treatment for one week. (3) A chemically pure 1 per cent solution of methylene blue in sterile normal saline at room temperature is instilled into the bladder, not more than 15 c.c. being used. The patient is instructed not to micturate for one hour. Occasionally, in very irritable bladders of small capacity, as little as 3 c.c. only may be tolerated at first. These instillations are given twice a week for four weeks and then stopped for one week. (4) Once a week up to 4 oz. of warm liquid paraffin are allowed to gravitate into the bladder after the methylene blue has been voided. Some of the oil remains in the bladder for a week, during which time droplets are continually found in the voided urine. [Paraffin injected into the bladder has a most soothing effect in tuberculous as well as in other forms of cystitis, —II. B.] (5) Once a week before the methylene blue instillations the bladder is irrigated with a warm sterile alkaline solution composed of 2 per cent sodium bicarbonate. The bladder is then washed with warm water before the dye is instilled. (6) Alkalis are prescribed by mouth during the treatment.

J. C. Negley⁸ considers that preliminary ultra-violet irradiation of liquid paraffin about to be instilled into the bladder offers a possibility of therapeutic results. H. Meschede⁹ has also been working on ultra-violet radiation of the bladder. He finds that the interior of the bladder is ten times as resistant as the skin to ultra-violet rays. Whereas an erythema of the skin is produced at 3 cm. in three minutes, in the bladder it requires half an hour. After six months' trial he is satisfied that many patients with tuberculosis of the bladder have been improved considerably.

The value of *presacral neurectomy* in cases of intractable pain of vesical tuberculosis has been referred to above.

When the symptoms of vesical tuberculosis become intolerable and the bladder capacity is reduced greatly (thimble bladder), and especially if one kidney has been removed for tuberculosis, A. Schunk¹⁰ advises *cutaneous ureterostomy*. He has carried out this operation on five patients who were

unrelieved by any other measures. Complete disappearance of all the physical symptoms was the rule.

Bilharziasis of the Bladder.—J. Perves¹¹ finds that the treatment of bilharziasis by *antimony* is highly successful. Intramuscular injections are almost painless. Fouadin (Bayer) is the preparation he recommends. On the first day $1\frac{1}{2}$ c.c. are injected, on the second $3\frac{1}{2}$ c.c., and on the third 5 c.c., and then every second day a further 5 c.c. until ten injections have been made. The treatment thus lasts for seventeen days and rarely requires repetition. *Fulguration* of the bilharzia papillomata is also useful, but *per se* it is not curative. J. B. Christopherson and R. O. Ward¹² have studied a case of vesical bilharzia in England. The patient returned from South Africa five years ago. The beautiful cystoscopic picture (Plate IV) illustrates the effectiveness of treatment by antimony.

Suprapubic Cystostomy.—H. Cabot¹³ dwells upon the importance of avoiding infection of the prevesical space (cave of Retzius). Infection can be avoided by correct technique. Having made the usual longitudinal incision through the aponeurosis, retractors are placed, and 2 cm. above the pubis the

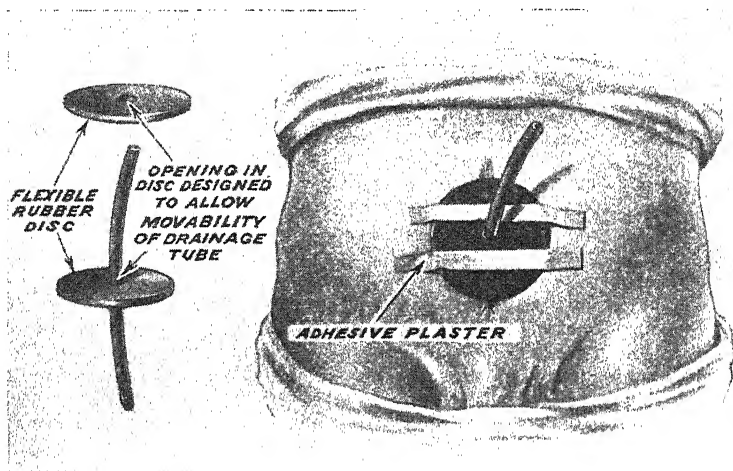


Fig. 5.—Simple apparatus for maintaining long-continued and permanent drainage of the bladder. (Re-drawn from 'Surgery, Gynecology and Obstetrics'.)

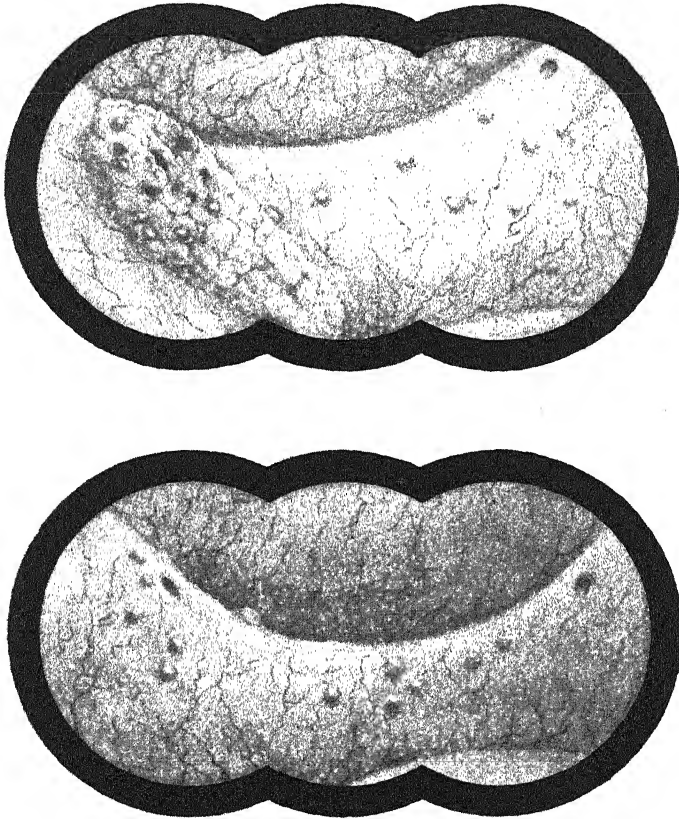
bladder is exposed by gentle blunt dissection carried out in a transverse direction (Plate V). When the bladder is seen it is picked up with Lane's forceps and a very short vertical incision is made into the (generally) hypertrophied organ until the mucosa bulges through. Cabot then quickly incises the mucosa and inserts an aspirator to empty the bladder, thus avoiding contamination by the presumably infected urine. After the drainage tube—which should not be too large—is stitched into position snugly the wound is irrigated with a mild antiseptic. Using this technique the cave of Retzius is not opened and no drainage is necessary.

For patients who require suprapubic drainage permanently or for a long time, A. B. Cecil¹⁴ advocates the simple apparatus illustrated in Fig. 5. This permits the patient himself to adjust the depth of the tube and to remove it for boiling and cleansing. De Pezzer catheters are difficult to get out and are

PLATE IV

BILHARZIASIS OF THE BLADDER

(J. B. CHRISTOPHERSON and R. OGIER WARD)



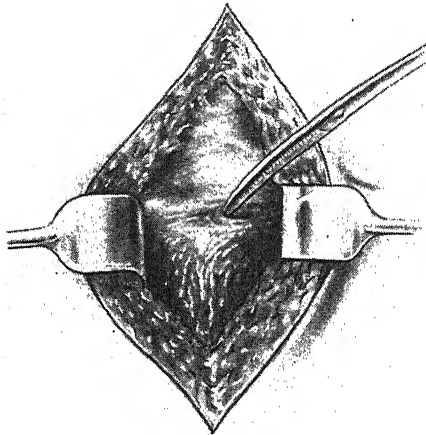
Bilharzia disease of the bladder before treatment and one month after treatment with sodium antimony tartrate. The yellow nodules in the lower figure are the dead ova working their way through the bladder cavity. They do not indicate active bilharzia disease.

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PLATE V

SUPRAPUBIC CYSTOSTOMY

(H. CABOT)



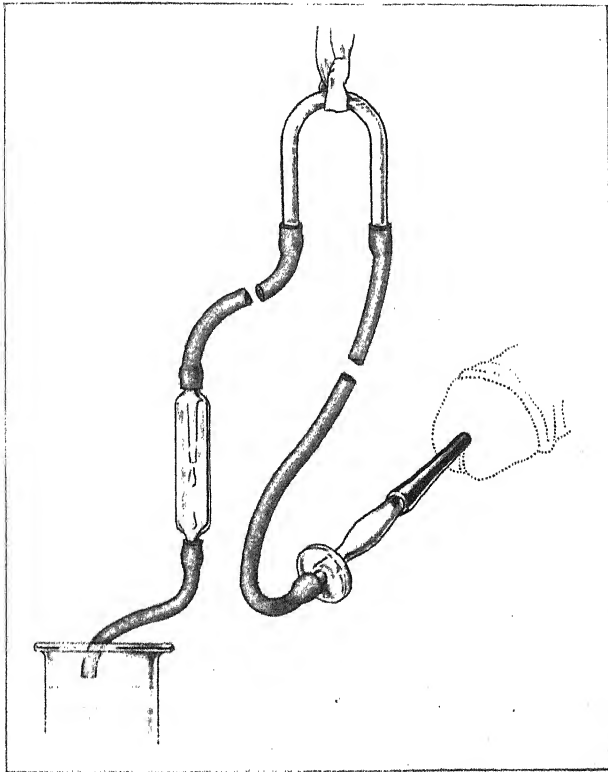
Cabot's method of performing suprapubic cystostomy without opening the cave of Retzius.
The bladder is exposed by blunt dissection carried out in a transverse direction.

*Re-drawn from the
'Proceedings of the Staff Meetings of the Mayo Clinic'*

PLATE VI

DECOMPRESSION OF THE BLADDER

(HAMILTON BAILEY)



Apparatus for decompression of the bladder. Some rubber tubing, the nozzle of a Higginson's syringe, a piece of glass tubing suitably bent, and an interrupter are the requisites.

PLATE VII EXTRAPERITONEALIZATION OF THE BLADDER

(H. MORTENSEN)

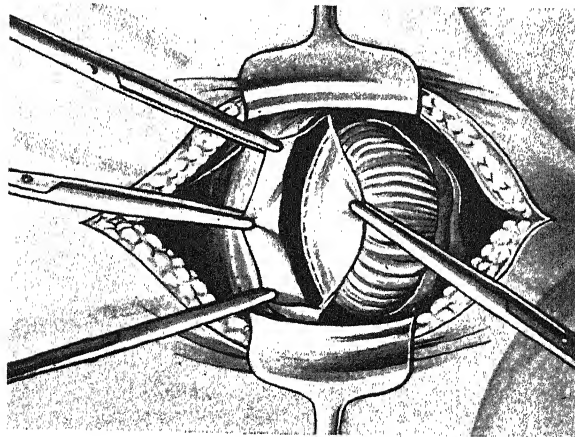


Fig. A.—Demonstrating the incision through the peritoneum at its reflection anteriorly on to the bladder and the line of incision posteriorly.

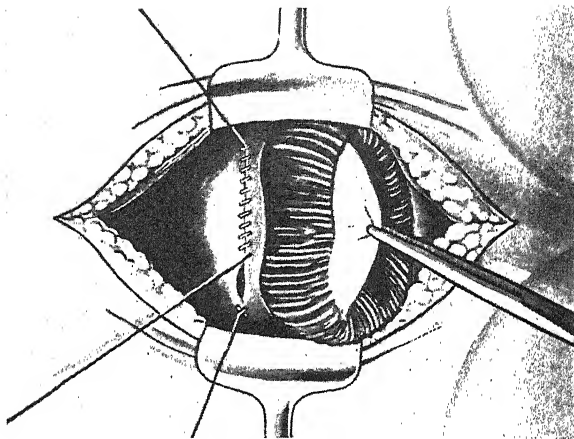


Fig. B.—Demonstrating the peritoneum being reconstituted by a line of closely set sutures and the mobilization of the bladder.

therefore not often cleaned. They are apt to break, to collect lime salts, and to harbour infection. Cecil's tube can be removed easily without pain and the patient can sterilize it every day.

Persistent Post-operative Suprapubic Fistula.—Among the most common local causes of persistent suprapubic fistula is that associated with faulty technique of the operation of suprapubic cystostomy, resulting in prolapse of the mucosa between the rectus muscle. Other causes are unrelieved obstruction of the neck of the bladder and an overlooked infected diverticulum. (E. Beer.¹⁵)

Retention of Urine in Cases of Spinal Injury and Spinal Disease.—The treatment of the concomitant retention of urine is a major problem. So often in these cases the exitus of the patient is not directly due to the nervous lesion, but to ascending pyelonephritis. There are three main plans of dealing with the retention of urine: (1) Intermittent catheterization. (2) Absolutely no catheterization, allowing the overflow to take care of drainage from the distended bladder, and assisting the bladder by pressure upon the abdominal wall. This is continued until automatic micturition occurs, the reflex being assisted by external stimuli. Comparatively few cases have been reported where this method has acted satisfactorily. (3) Suprapubic drainage. M. L. Boyd¹⁶ is strongly of the opinion that suprapubic cystostomy is the right course to adopt in nearly all these cases.

Decompression of the Bladder.—It has been known for generations that suddenly to empty an overfull bladder is to court disaster. In the relief of acute retention of urine the aim should be to empty the bladder slowly and evenly. A bung in the catheter's mouth is still the only means of controlling the outflow known to the majority of the profession. Decompression of the bladder by a U-tube is the method of choice. A home-made apparatus can be rigged up by the practitioner in the patient's home. All that is required is some rubber tubing, the nozzle of a Higginson's syringe, a glass U-tube, and an interrupter to prevent suction.* *Plate VI* makes a detailed description of the apparatus unnecessary. We will assume that a gum-elastic catheter has been introduced through the urethra and has been tied in. Into the mouth of the catheter is placed an ordinary glass nozzle, the tip of which has been dipped in collodion, and the junction is further secured by whipping it round with a strip of narrow gauze moistened with collodion. In order to support the penis connected to the apparatus a piece of broad adhesive is applied to the thighs so as to form a sling between them. Upon this sling rests the nozzle. The end of the penis is wrapped up in gauze soaked in flavine, to minimize the great drawback to the tied-in catheter, namely, urethritis. The U-tube is slung at such a height that the urine just trickles over when the patient coughs. In general the instructions are that it should be lowered 2 in. per diem. Some homely object can usually be found upon which to hang the U-tube at a correct hydrostatic level; for instance, a hat-stand may be borrowed from the hall. Applying these principles, asepsis is far more assured, and the rate of emptying is controlled, not by rough calculations, but with the precision of gauge-controlled hydrostatic pressures. (H. Bailey.¹⁷)

Carcinoma of the Bladder.—The committee of the American Urological Association¹⁸ have investigated nearly 1000 collected cases of carcinoma of the bladder. They find that the disease is more than three times more common in the male, and the peak of the age incidence is between 40 and 50 years. In one quarter of the patients definite loss of weight was the major symptom. The site of the neoplasm is diagrammatically represented in *Fig. 6*. It will be seen that the trigone and the lateral walls are much more often attacked than

*These can be obtained from Crookes' Laboratories at a small cost.

the rest of the organ. In one-third of the cases the tumours are multiple. The cardinal symptom of bladder tumour is painless hæmaturia. In only 10 per cent of cases was cystoscopy performed within one month of the appearance of this ominous sign. In fully 50 per cent of cases the hæmaturia persisted

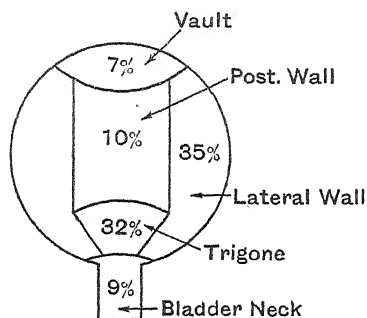


Fig. 6.—Diagram showing sites for carcinoma of the bladder.

age of cases than that which follows operation for cancer afflicting any other organ of the body. It can be performed with a relatively low mortality and leave the patient in physical comfort for later life. (R. C. Coffey.¹⁹)

Vesico-intestinal Fistula.—In five cases of intestino-vesical fistula reported by R. J. Willan²⁰ there was one due to tuberculosis of the small intestine, one to diverticulitis, two to a vesical or prostatic calculus ulcerating through into the rectum, both patients having an enlarged prostate, and one to carcinoma of the pelvic colon.

Implantation of a Ureter into the Bladder.—It is commonly agreed that the end-results of transplantation of the ureter into the bladder are not as satisfactory as they should be. This is all the more surprising since implantation of the ureter into the bowel has been followed by brilliant and lasting results. Obviously, the probability of this failure lies in imperfect technique.

H. Heidler²¹ has applied to the bladder Coffey's technique of implanting the ureters into the bowel. He has performed the operation in five instances with apparently satisfactory results. Heidler's method seems to be worthy of an extended trial.

Extraperitonealization of the Bladder.—Most carcinomata of the bladder unfortunately occur around a ureteric orifice, where the technical difficulties of their removal are great. Coupled with this is the necessity for dealing satisfactorily with the involved ureter, which in many instances must be transplanted. A procedure which simplifies the operation is therefore worthy of note. The Voelcker method of extraperitonealization of the bladder is described by H. Mortensen.²² The preliminary stages of the operation are directed to freeing the bladder from its peritoneal attachments. The bladder being exposed, an incision is made anteriorly and posteriorly through the peritoneum at its attachment to the bladder (*Plate VII*). These incisions are then united by closely-set sutures and the peritoneal cavity is reconstituted. A pack is placed over the line of sutures as a safeguard against probable leakage when the bladder is opened. It is then possible to strip the bladder from its loose fascial attachments posteriorly and it becomes a freely mobile organ. This procedure renders all parts of the bladder accessible for any operative manœuvre. [The reviewer has found this operation a revelation; it

Complete cystectomy for carcinoma of the bladder, if performed early, would bring a cure in a larger percentage of cases than that which follows operation for cancer afflicting any other organ of the body. It can be performed with a relatively low mortality and leave the patient in physical comfort for later life. (R. C. Coffey.¹⁹)

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is equally useful for partial cystectomy or for the removal of an inaccessible bladder diverticulum.—H. B.]

REFERENCES.—¹*Chinese Med. Jour.* 1933, xlvii, 344; ²*Austral. and N.Z. Jour. Surg.* 1933, iii, 71; ³*Irish Jour. Med. Sci.* 1933, 209; ⁴*Amer. Jour. Surg.* 1934, April, 442; ⁵*Zeits. f. urol. Chir.* 1933, Nov., 145; ⁶*Jour. de l'Hôtel Dieu de Montreal*, 1933, Sept., 208; ⁷*New Eng. Jour. Med.* 1933, Dec. 7, 1153; ⁸*Calif. and Western Med.* 1933, Oct., 236; ⁹*Wien. klin. Woch.* 1932, Oct. 28; ¹⁰*Jour. d'Urol.* 1933, March; ¹¹*Arch. de Mal. des Reins et des Org. gén.-urin.* 1933, vii, 403; ¹²*Brit. Jour. Surg.* 1934, April, 632; ¹³*Proc. Staff Meetings Mayo Clinic*, 1933, 672; ¹⁴*Surg. Gynecol. and Obst.* 1934, March, 630; ¹⁵*Ibid.* 1933, 959; ¹⁶*Southern Med. Jour.* 1933, June, 540; ¹⁷*Brit. Jour. Urol.* 1934, Sept., vi, 225; ¹⁸*Jour. of Urol.* xxxi, No. 4, 423; ¹⁹*Urol. and Cutan. Rev.* 1933, xxxvii, 723; ²⁰*Brit. Med. Jour.* 1933, July 22; ²¹*Zeits. f. urol. Chir.* 1933, Nov., 175; ²²*Austral. and N.Z. Jour. Surg.* 1933, July, 71.

BLOOD DISEASES. (See also ANÆMIA, PERNICIOUS; SPLEEN, SURGERY OF.) *Stanley Davidson, M.D., F.R.C.P.E.*

It would be unreasonable to expect that the remarkable growth in our knowledge of blood diseases should continue at the same rate as during the past ten years. Consequent on the researches of Whipple and Robscheit Robbins, and of Minot and Murphy, the important conclusion has been reached that the largest and most important group of blood diseases occurs as the direct consequence of a deficiency of one or other of the factors necessary for normal blood production. In consecutive issues of the MEDICAL ANNUAL during the past four years the reviewer has described in detail the published evidence regarding this modern conception of the anæmias. During the past year no important discovery has been made. Hamatologists all over the world have been occupied in consolidating their recent victories by filling in the gaps in our knowledge which had not been fully investigated during the past years. Since a concise account of the advances which have taken place during the past decade is given in the *Ten-year Index to the Medical Annual* just published, the reviewer proposes to devote his space primarily to details of the papers which have appeared during the past year. A separate account is given of pernicious anæmia (see ANÆMIA, PERNICIOUS).

THE BLOOD OF NORMAL MEN AND WOMEN.

From a study of the erythrocyte counts, hæmoglobin, and volume of packed red cells in 229 individuals, M. M. Wintrobe¹ considered that the normal values of the blood of adults are:—

1. *Red-cell count*: men, average 5·4 million, with 4·6 to 6·2 million as the limits of normal; women, average 4·8 million, ranging from 4·2 to 5·4 million.

2. *Hæmoglobin*: men, average 16 grm. per 100 c.c. of blood, with 14 to 18 grm. as the limits of normal; women, average 14 grm., ranging from 12 to 16 grm. (If hæmoglobin must be expressed as a percentage, 14·5 grm. per 100 c.c. of blood should be used as the equivalent of 100 per cent.)

3. *Volume of packed red cells*: men, average 47 c.c. per 100 c.c. of blood, with 40 to 54 c.c. as the limits of normal; women, average 42 c.c., ranging from 37 to 47 c.c.

The reviewer would agree with Wintrobe's assessment that 14·5 grm. hæmoglobin should correspond with 100 per cent hæmoglobin. The present Haldane standard of 13·8 grm. hæmoglobin per cent is too low. On the other hand, it is certainly not our experience in Aberdeen that the average figure for males is 16 grm. hæmoglobin per cent, which equals 116 per cent hæmoglobin on the Haldane scale. It appears to be true, however, that the average figures found in America are higher than those in Great Britain.

HYPOCHROMIC ANÆMIA (INCLUDING ACHLORHYDRIC ANÆMIA).

The frequency with which iron-deficiency anæmias are found in adult women and infants cannot be too often or too strongly emphasized. Since the literature dealing with the etiology and treatment of this condition was fully dealt with in last year's MEDICAL ANNUAL (p. 27), and the position is again summarized in the *Ten-year Index* already referred to, the reviewer does not consider it necessary to discuss the papers which have appeared during the past twelve months, the data published mainly confirming previous reports.

ACHOLURIC JAUNDICE.

W. F. and G. Cheney² report eight cases and give an excellent review of the clinical and hæmatological manifestations of hereditary hæmolytic jaundice. The authors rightly stress the importance of cell diameter and cell volume measurements in the diagnosis of doubtful cases. In acholuric jaundice the mean diameter of the erythrocyte is small (less than 7μ instead of the normal 7.2 to 7.5μ), while hæmatocrit determinations show the cell volume to be approximately normal—in other words, the microcytes present are more globular than normal erythrocytes. Such a finding in the presence of latent jaundice, however faint, is almost pathognomonic. In other forms of jaundice the diameter of the erythrocyte is normal, or not infrequently larger than normal.

Splenectomy is the only treatment of value, preceded by blood transfusion in cases in which the hæmoglobin level is low. In the hands of a skilled operator the operative mortality is stated to be under 5 per cent. The operation in acholuric jaundice does not present the technical difficulties occurring in the removal of the spleen in splenic anæmia. The patient's recuperation is excellent, since any blood loss is rapidly made good by the hyperplastic bone-marrow.

HODGKIN'S DISEASE.

Little advance has been made during the past twelve months in our knowledge of the etiology of Hodgkin's disease. The claim that the avian strain of the *Bacillus tuberculosis* is the specific agent has been finally disproved, and the hopes of the Australian workers that they had discovered a specific treatment by the use of serum derived from hens previously inoculated with lymphogranulomatous tissue, have not materialized. In the MEDICAL ANNUAL for 1933 (p. 223) details were given of Gordon's claim that the intrathecal inoculation of extracts of Hodgkin's tissue into rabbits caused an encephalitis which could not be produced by extracts from organs other than those of patients suffering from Hodgkin's disease. U. Friedemann and A. Elkeles³ now report that a similar encephalitis in rabbits can be produced by the intrathecal injection of sterile bone-marrow emulsions. Equally good results were obtained with normal bone-marrow as with bone-marrow from persons suffering from blood diseases. The authors acknowledge the possibility that the encephalitis may be produced by a virus normally present in rabbits which has been stirred up by the intrathecal injection. In view of these findings the specificity of Gordon's test may have to be reconsidered.

THE ACUTE LEUKÆMIAS.

C. E. Forkner⁴ reports 8 cases of acute leukæmia, 6 of which were classified as acute monocytic, while the remaining 2 were acute myeloblastic and acute lymphoblastic leukæmia. The author reviews the clinical history and blood findings in 22 additional cases of acute monocytic leukæmia published in the

literature. He concludes that, apart from the hamatological and histological differences between the three types of leukemia, there exist clinical features which help to differentiate them. Of particular importance are the changes in the mucous membrane of the gums and pharynx. In 24 out of 28 cases of acute monocytic leukemia, ulceration and necrosis of the gums occurred, and often in addition a diffuse cellulitis, causing swelling and pain, and inflammation extending into the deeper tissues of the face. Because of these presenting symptoms the patients had consulted their dentists early in the course of the disease. The author admits that patients with acute lymphatic or acute myeloblastic leukemia frequently have symptoms referable to the mouth and mucous membrane, but in his experience these lesions have been limited to hæmorrhage and slight infection, and were not characterized by severe ulceration and necrosis. Other physical signs helpful in the differentiation of the acute leukaemias are referable to the spleen and the lymph nodes; thus the spleen is generally not palpable in acute myelogenous leukemia, whereas in acute lymphatic leukemia and in the majority of cases of acute monocytic leukemia it may be felt 2 cm. or more below the costal margin. With regard to the size of the lymph nodes, there is a distinct general enlargement of these in acute lymphatic leukemia, although the degree is by no means so marked as that found in the chronic disease. In acute monocytic leukemia the lymph nodes in the neck may be slightly or moderately increased in size, but general enlargement is not usually seen. Lymph nodes are rarely palpable in acute myelogenous leukemia. The final diagnosis must depend on histological and hæmatological examinations, which present great difficulties, even to the expert. While it is of academic interest to differentiate the three types of acute leukemia, from a practitioner's point of view it matters little, since treatment is unavailing in all cases and death occurs rapidly within a period of a few weeks.

POLYCYTHÆMIA VERA : ERYTHRÆMIA.

An excellent review of the treatment of erythremia is given by C. Eggleston and S. Weiss.⁵ All successful forms of treatment are directed towards reducing the number of red cells in the circulation, thus relieving the two outstanding features of the disease—namely, increased blood volume and increased blood viscosity. The problem has been attacked by two methods:—

1. By direct action against the erythrocytes in the circulating blood. This may be done by venesection and to a greater extent by the use of hæmolytic agents. The drug most frequently used to-day is *phenyl hydrazine hydrochloride*. The dose must be controlled by frequent blood studies. The safest procedure is to give the patient from $1\frac{1}{2}$ to 3 gr. daily in a cachet until the erythrocyte count approaches normal, and then to put the patient on a maintenance dose, which may be as low as $1\frac{1}{2}$ to 3 gr. weekly. One of the objections to phenyl hydrazine hydrochloride has been its tendency to produce toxic symptoms, particularly those associated with a gastro-intestinal upset. According to recent reports by C. T. Stone, T. H. Harris, and M. Bodansky,⁶ acetyl phenyl hydrazine is equally effective without producing toxic symptoms so readily in similar doses.

2. By reducing the activity of the erythrogenic tissue in the marrow. To control the hyperplastic bone-marrow irradiation has been extensively used, and often with good results, but a new form of therapy, viz., *dieto-therapy*, has been suggested. This treatment is based on the hypothesis that excessive amounts of intrinsic factor are produced in the stomach of a patient suffering from this disease, leading to an overactivity of the bone-marrow. Particular interest must be attached to the report by G. A. Friedman⁷ of 20 cases of

polycythæmia associated with duodenal ulcer, a disease in which excessive secretion of hydrochloric acid and enzymes is known to occur. The whole question of the relationship of polycythæmia to duodenal ulcer is reviewed by W. Boyd.⁸ J. F. Wilkinson⁹ has shown that an extract from a given quantity of liver from a case of erythræmia had a greater potency in the treatment of pernicious anæmia than a similar amount of extract obtained from normal human liver. It would be possible to argue, in the light of the above data, that polycythæmia and pernicious anæmia are the result of excessive and defective gastric secretion respectively. Acting on this hypothesis, R. Morris¹⁰ suggested that a diet low in purin over a long period might be effective. He also reports a patient with erythræmia and gastric ulcer who had frequent gastric lavage over a period of six months, with a steady decrease in the blood count from 10,000,000 to 5,000,000. When the lavage was discontinued the count returned to 10,000,000 at the end of five months. While no conclusion could be drawn from one case, it seems not unreasonable to restrict severely foodstuffs which are rich sources of the extrinsic factor of Castle, or the natural storehouses of the elaborated anti-anæmic factor, e.g., liver, kidney, pancreas, red meat, and preparations of yeast or wheat embryo.

THROMBOCYTOPENIC PURPURA.

K. P. A. Taylor¹¹ describes a case of thrombocytopenic purpura with capillary hæmorrhages of moderate severity, which failed to respond to the usual treatment. *Bothropic antivenene* was given on two consecutive days, 10 c.c. and 5 c.c. intramuscularly, with a marked rise in platelets and a rapid fall in the bleeding time. This case is of particular interest in view of the recent report of the value of snake venom in the treatment of hæmophilia.

SPLENIC ANÆMIA: BANTI'S SYNDROME.

Herbert Fox¹² has made a pathological and clinical study of 23 cases of splenic anæmia. The chief points in the pathological diagnosis are: the spleen is enlarged and weighs from 600 to 1600 grm.; the follicles are diminished in number and size; the sinuses are dilated and fibrous tissue is everywhere increased. The view is expressed that liver damage occurs much earlier in splenic anæmia than one is led to believe by the older descriptions of Banti's disease. Of 14 cases traced by the author, only 2 lived for two years without clinical or definite pathological information that the liver was involved.

Under the name of "Hepatolienal Fibrosis" J. McMichael¹³ gives an excellent description of the pathology of the spleen and liver in 45 cases of splenomegaly, the majority of which could be classified as splenic anæmia. The splenomegaly is stated to be brought about by two factors: (1) Venous congestion; and (2) A factor causing cellular proliferation within the spleen. In about half the cases hepatic cirrhosis was so gross as to explain the congestion adequately. Vasodilatation of the hepatic artery and spasm of the portal venules within the liver are stated on experimental grounds to be possible causes of increased portal pressure. McMichael was impressed by the frequency with which he found histological evidence of hepatitis in livers which appeared to be normal to the naked eye. Accordingly he believes that the proliferative changes in the spleen are directly associated with the inflammatory processes in the liver.

TREATMENT.—In a recent paper by the reviewer¹⁴ it was pointed out that the majority of text-books give the impression that *iron* is of no value in the treatment of splenic anæmia. The reviewer explains in this paper that it is difficult to understand this attitude, since the three common causes of

hypochromic anaemia are frequently present in patients suffering from splenic anaemia. These may be summarized as: defective intake of iron through poor diet; failure in absorption of iron consequent on achlorhydria; and increased demands for iron following blood loss. The reviewer has had excellent results from the administration of massive doses of iron (*Fig. 7*). In addition the rationale for *splenectomy* is discussed, and the conclusion is reached that there is little to recommend the operation apart from the possible relief of portal congestion which may result from the tying off of the splenic circulation. Before splenectomy can be proved to be the treatment *par excellence* which many suppose it to be, it would be necessary to compare the cases adequately treated with iron with those who have received splenectomy. Unfortunately no such data are at present available. It is well recognized that at least 50 per cent of individuals who have had gastric hæmorrhages prior to operation, continue to have them subsequently. In the paper by Fox¹² mentioned above, of the 23 cases under discussion, 6 died following splenectomy, 8 are reported living three to eight years after operation, and all are invalids; 6 of these 8 are recorded as having post-operative hæmorrhages. It can scarcely be suggested that these results justify the submission of a patient to the very severe risk of splenectomy.

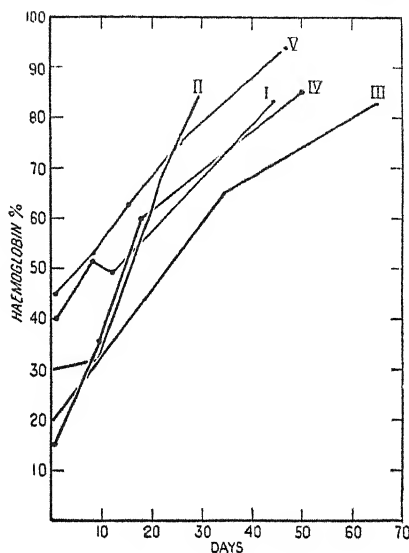


Fig. 7.—Graph illustrating the hæmoglobin percentage increase in five cases of splenic anaemia treated with iron.

AGRANULOCYTIC ANGINA: IDIOPATHIC NEUTROPENIA.

A most excellent review of the present status of our knowledge of the different forms of neutropenia is given by Regena C. Beck.¹⁵ Idiopathic neutropenia may be defined as a disease characterized by sudden onset, fever, and in most cases sepsis of greater or less degree (usually oral), and extreme leucopenia with a marked reduction in the percentage of polymorphonuclear cells.

NOMENCLATURE.—Werner Schultz in 1922 proposed the name 'agranulocytosis'. Since the name 'agranulocyte' was originally chosen for neutrophils without granulation seen in blood smears in cases of leukemia, the term is unfortunate. Friedemann, being impressed by the usual severe localization of the process in the throat, suggested the name 'angina agranulocytica', but this name also cannot be recommended, since cases occur without angina and also because the term suggests that the infection of the mouth causes the neutropenia, instead of the reverse, viz., that the neutropenia causes the infection in the mouth. Probably the term 'idiopathic neutropenia', as suggested by Baldridge and Needles, or 'granulocytopenia', is the most appropriate name. It is possible to divide the disease into two main classes: (1) Primary neutropenia, in which the etiology is unknown; and (2) Secondary neutropenia, in which the etiological agents are evident, e.g., infections, toxæmias, and depressant drugs.

HISTORY.—If malignant neutropenia had existed to any great extent prior to 1922, it undoubtedly would have been described long before, since the disease runs such a dramatic course and usually terminates fatally. Blood-counts have been made as a routine procedure for the past fifty years. Nevertheless a study of the literature reveals very few cases prior to 1922 which could be with certainty classified as 'idiopathic neutropenia'.

ETIOLOGY.—The etiology of primary neutropenia is still not understood, but it would be safe to say that the essential fault lies in the bone-marrow. In some cases aplasia of the leucocytic tissue is found, while in others normal or hyperplastic marrow is present. In the latter case it is assumed that the lowering of the granulocytes in the peripheral blood is due to a failure in maturation of the myeloblasts and myelocytes in the bone-marrow. The mechanism would therefore be analogous to that occurring in pernicious anaemia. S. R. Roberts and R. R. Kracke¹⁶ made a statistical study of 8000 records of leucocyte counts from a series of patients, between 1920 and 1930. One out of every four patients had a granulopenia of 4000 or less, and it was from this group that idiopathic or secondary neutropenia developed. Another point of great interest in the report was that the symptoms of weakness, exhaustion, fatigue, and tendency to sleep are the chief results of a depressed granulocyte count. For the prevention of agranulocytosis, then, a leucocyte count might be of the greatest value as indicating the need for special care in guarding against infections, toxæmias, and depressant drugs. The importance of the coal-tar series of drugs as bone-marrow depressants is receiving much attention in America.

F. W. Madison and T. L. Squier,¹⁷ after reviewing the 8 cases of primary granulocytopenia described by R. R. Kracke¹⁸ as occurring after the taking of such drugs, proceeded to give the histories of 14 cases of their own. They note that during the past six years 500 cases of granulocytopenia are on record, which contrasts markedly with the rarity of the disease previously. Coincident with this period drugs such as amidopyrin and arspenamine, which contain the benzene ring, have become widely employed. They also draw attention to the fact that the disease has appeared most frequently in persons who are apt to take such drugs, such as physicians, nurses, and those directly under the charge of physicians. Six of their patients who continued to take amidopyrin died; while of the group of 8 patients who discontinued the use of the drug, only 2 died. The administration of a single dose of amidopyrin to each of 2 patients who had recovered from the acute illness was followed by rapid and profound fall in granulocytes.

The reviewer wishes to point out that since many patients take amidopyrin and other similar drugs over a period of weeks without any ill-effect, it must be assumed that those patients who develop granulocytopenia have either an idiosyncrasy or have abnormal bone-marrow which is particularly easily damaged by the drug. Nevertheless, in view of these findings, it would be unwise to prescribe any drug containing the benzene ring to persons with a leucopenia.

W. P. Thomson's¹⁹ studies of 18 young women suffering from agranulocytic angina suggest that there may possibly be some relationship between the granulocytopenia and menstruation. In 17 out of the 18 patients subjective symptoms occurred within a day or two of the onset of the menstrual period. In 6 of these cases a recurrence of granulocytopenia coincided with the onset of a catamenia. The author suggests that it may be possible that in some cases of agranulocytosis a relationship exists between the hormones associated with menstruation and the neutropenic episodes. Henry Jackson, jun., and Dudley Merrill²⁰ similarly report an interesting case, and graphically show how the leucocytes are depressed at the onset of each menstrual cycle.

TREATMENT.—The treatment of this condition was described in detail by the reviewer in last year's edition of the MEDICAL ANNUAL. (p. 15). *Pentose nucleotide K.G. 96* has been tried in many more cases, and satisfactory results continue to be published by various authors. Nevertheless the reviewer's information, based on a recent tour of America, leads him to conclude that the results are less satisfactory than a study of the literature indicates.

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BLOOD TRANSFUSION. (See SURGICAL TECHNIQUE.)

BLOOD VELOCITY. (See also HEART FAILURE, THYROIDECTOMY IN.)

A. G. Gibson, M.D., F.R.C.P.

C. W. C. Bain¹ has investigated a clinical method of determining the speed of the circulation by the time taken for the face to flush after the injection of *histamine*. This is given in doses of 0.001 mgrm. per kilo. of body weight. Ampoules were made up containing 0.128 mgrm. dissolved in 10 min. of saline: 5 min. of this, roughly a 1-5000 solution, was a sufficient dose for a 10-stone patient. The normal time taken for the flush to appear after injection into the arm vein is from 19 to 25 seconds. The time is lessened in hyperthyroidism, in the effort syndrome, advanced anæmia, and diseases of the lung. In conditions of cardiac decompensation, even before symptoms were marked, the flush time was increased to over 30 seconds, and in venous congestion with œdema it often reached 40 seconds. The test has certain disadvantages, one of which is that in about a quarter of the patients a severe headache follows the injection; and in patients with serious cardiac failure it is not without danger.

Another method of clinically testing the velocity of blood-flow is by the use of *sodium dehydrocholate* (decholin). It is described by S. L. Gargill.² It was first employed by Winternitz, who injected 5 c.c. of a 20 per cent solution into an arm vein and measured the time that elapsed between the end of the injection and the appearance of a bitter taste on the tongue. Winternitz found this interval to be 8 to 14 seconds. Occasionally larger injections produced epigastric distress and nausea. Gargill finds that 3 c.c. of a 20 per cent solution is a sufficient dose in normal subjects, and this amount is injected from an 18-gauge needle in two to three seconds and the exact time is noted at the end of the injection. The procedure can be repeated after an interval of one to two minutes because the bitter taste quickly disappears, and it is therefore possible to make a second observation so as to confirm the first while the needle is still in place. His method is to use 10 c.c. of the solution drawn up into a sterilized syringe, which is left in place between the two observations. The normal circulation time (arm-vein to tongue) by this method is between 14 and 15 seconds. No untoward effects have been noted in over 150 patients. In a few subjects with marked arteriosclerosis or congestive failure the circulation time was prolonged to about 30 seconds. It seems a good practical test for estimating the velocity of the circulation without danger or discomfort.

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BLOOD-PRESSURE, RAISED. (*See* HYPERTENSION.)**BLOOD-VESSELS, SURGERY OF.** (*See also* ANEURYSM; VARICOSE VEINS.)*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Ligation of Large Arteries.—M. R. Reid¹ states that the surgeon who has had the experience of cutting the human aorta, or some strongly pulsating artery, in two, when pulling a ligature tight, has a keen appreciation of the dangers of fracturing the arterial wall. To avoid this danger Reid practices the temporary proximal occlusion of a large artery during the procedure of tying a ligature. After thus removing the intra-arterial tension he did not experience the sensation of rupturing the artery when tying the ligature. By first removing the intra-arterial tension the ligature may be tied with just sufficient tension to occlude the lumen without any danger of rupturing the media or of cutting the vessel in two. He thinks the use of catgut for the ligation of large arteries is dangerous. Such a ligation may allow the full force of artery blood to be exerted on a segment of necrotic arterial wall before sufficient repair has taken place to withstand this force. When a large artery is occluded it is always a wise policy to divide it.

The reviewer has used catgut many times without mishap for the ligation of large arteries. For ligation of the innominate artery for subclavian aneurysm he used two ligatures, side by side, of No. 2 chromicized catgut close to the aneurysm. They were applied without tension. A third ligature was applied near the origin of the artery from the aorta. The latter was also loosely applied and was used with the object of reducing the arterial current before it reached the main ligatures (Murphy Oration²).

Reid draws attention to the effect of ligation and resection of a segment of a large peripheral artery upon the innervation of that artery and the peripheral vasomotor disturbances which frequently result. He states that considerable difference of opinion exists as to the true cause of the marked peripheral vaso-dilatation which follows the resection of even a small portion of a major artery.

[The reviewer³ has drawn attention to the advantages of arteriectomy, as demonstrated in a case of popliteal aneurysm in which gangrene was threatened.]

Reid concludes his paper by quoting W. S. Halsted, who says, "Let the surgeon who is about to ligate a large artery bear in mind the following facts:—

- "1. Fine ligatures cut through the arterial wall more rapidly than coarse ones.
- "2. Partially occluding ligatures and crushing ligatures are dangerous.
- "3. Absorbable ligatures may disintegrate unevenly, and thus a coarse ligature be reduced to a fine one; or the knot may slip and thus convert a total into a partial occlusion.
- "4. Intimal surfaces brought in contact cannot unite because the wall of the artery becomes necrotic under the coapting ligature.
- "5. The necrosed wall under ideal conditions becomes converted into fibrous tissue, into a solid cord, by the in-growth of blood-vessels from the ends.
- "6. Under certain conditions, for example when the lumen has not been totally occluded, or the wall of the artery has been too severely crushed, hæmorrhage may be prevented by the formation of a fibrous tissue capsule enveloping the ligature and the arterial defect. Moderately coarse ligatures may, without causing leakage of blood, cut their way through an artery ligated in continuity. In the wake of such a slowly cutting ligature, a partially obturating diaphragm is likely to form. There may be several crescentic-like diaphragms, their free concave edges bounding the lumen which remains.
- "7. A coarser ligature should be used in tying an artery in continuity than for occluding the ends of a divided one.

" 8. It is probably safer, when feasible, to divide an artery, tying off the ends, than to ligate it in continuity.

" 9. Catgut ligatures should not be employed, lest some strands be absorbed or loosened before the others, and it is probably inadvisable to tie with a bundle of threads of any kind. It is decidedly risky to apply—as has been recommended and practised—a partially coapting ligature central to the totally occluding one, for the arterial wall eventually giving way as it must under the former, it is only by the formation of an enveloping fibrous tissue capsule or by repair in the wake of the cutting thread that fatal hæmorrhage is prevented. For the ligation in continuity of large arteries I have been using narrow tape.

" 10. The wound should be closed without drainage, and completely.

" 11. If infected, the wound should be promptly and freely opened and treated by the Carrel method with an antiseptic solution which will not endanger the devitalized wall of the artery under the ligature."

To these "facts" of Halsted, Reid adds the following conclusions:—

1. When ligating large arteries less damage will be done to the arterial wall if the vessel is temporarily occluded, proximally (and distally), during the procedure of pulling the ligature tight.

2. The size of the ligature should vary directly with the size of the artery.

3. A method of anchoring ligatures on the end of a divided artery, in a sterile wound, is described.

4. Ligated large arteries should not be covered or buried in an infected wound. They should be accessible to the most scrupulous antiseptic treatment.

5. The presence of an infection does not justify the use of catgut for the ligation of large arteries. On the contrary, it makes more mandatory the use of an unyielding material, such as silk, tape, or the metallic band.

6. For temporary occlusion of a large artery the Matas-Allen flattened metallic band is best. It should be used whenever there is the remotest chance that it may be desirable to restore the lumen of an occluded vessel.

Thrombosis of the Axillary Vein.—Rudolph Matas in a paper read before the Southern Surgical Association, Virginia, on Dec. 12, 1933, describes an interesting example of this condition. He points out that this curious lesion of the axillary vein was first recognized in 1884. It is described by German and English writers as primary spontaneous or idiopathic thrombosis of the axillary vein. [The reviewer has seen one case in a female in the wards of the Mercer Hospital, Dublin.]

The distinctive features are swelling of the arm and cyanosis. Pallor has been observed in some cases. The œdema is firm and hard and extends to the hand and arm. There is usually pain in the whole arm. A tender hard cord may be felt in the track of the axillary vessels. There is no fever. The outstanding feature is the suddenness of the attack. There is complete disability following some unusual muscular strain or trivial muscular effort. The patients are usually young and robust.

Matas mentions the case of a waiter who became fatigued after several hours waiting at table, and of a woman who was stricken after beating clothes with a stick. There was also the case of a girl of 19 in whom axillary thrombosis followed the vigorous stirring of a Christmas pudding. There appears no doubt that trauma in some form or other, whether trivial or violent, is the *causa causans* of the pathological lesion in the vast majority of cases. There may be predisposing causes such as focal infection, and many writers attribute the injury to the vein to over-stretching and contusion between the clavicle and first rib, the costo-coracoid ligament, and the subclavius muscle. When the latter muscle is suddenly stretched with the arm in an abducted position there will be a sudden increase in the intravenous tension sufficient to rupture

a valve. Traumatic endophlebitis and thrombosis supervene. The right arm is much more frequently affected than the left.

DIAGNOSIS.—In making the diagnosis, œdema of the arm immediately or a few hours or days after a muscular strain is significant. There is no fever or signs of local inflammation. Dilatation of venous tributaries on the anterior chest wall and corresponding shoulder are sometimes noticeable.

PROGNOSIS.—The duration of the disability is variable; in very favourable cases there may be recovery within a month. One patient, as reported by Baum, complained of persistent and recurring œdema one and a half years after the accident. The frequency of relapse on the slightest provocation must be borne in mind.

TREATMENT.—Benefit is obtained by rest, immobilization, bandaging, elevation, physiotherapy, etc. Elevation of the arm and the use of an elastic bandage to reduce the œdema, gives relief after the acute stage is over. When the condition persists or there is a constant tendency to recurrence Matas recommends surgical exploration at the site of the lesion. The best results are obtained by the excision of the thrombotic venous segment. The relief following such an operation is probably explained by the vasodilator effects of removal of the sympathetic fibres in the coats of the resected vein.

After very full discussion Matas believes that none of the theories at present advanced to explain this condition are, taken singly, satisfactory.

Arterial Disease of the Extremities.—Dickson Wright⁴ points out that in cases of *arteriovenous aneurysm* the heart may become seriously affected, and believes that the cure of the heart condition lies in the treatment of the aneurysm. The treatment is quadruple ligation of artery and vein, above and below the lesion, or excision of the connecting channel. Proximal arterial ligation is always followed by gangrene. [The reviewer drew attention in the MEDICAL ANNUAL to a number of these cases during the latter period of the war.]

Dickson Wright states that if *arterial embolism* is diagnosed immediately there is a 50 per cent chance of saving the limb. The syndrome of sudden agonizing pain followed by cadaveric paleness with a sharp line of demarcation is so characteristic that once seen it is never forgotten. He classifies the diseases which reduce the arterial calibre into: (1) Those due to vasomotor neurosis—diseases of women and the upper limbs; (2) Those due to the formation of inflammatory or other deposits in the arterial coats—diseases of men and the lower limbs. Raynaud's disease comes under the first group. It can be definitely cured by ganglionectomy, if the severity of the condition warrants a major operation. Erythromelalgia is the opposite of Raynaud's disease, the fingers becoming hot and red instead of blue and cold.

Dickson Wright draws further attention to *thrombo-angiitis obliterans*. [The reviewer has seen a number of these cases in recent years: they are far more common than is generally appreciated.] He has seen dramatic improvements follow the extraction of bad teeth. Amongst other forms of treatment suggested is the injection of hypertonic saline intravenously, as advocated by Silbert, in order to lessen the viscosity of the blood; 300 c.c. of 5 per cent saline solution is given three times weekly for a monthly course.

Gangrene Due to Thrombo-angiitis Obliterans.—S. S. Samuels⁵ believes that extreme conservatism in thrombo-angiitis obliterans is not only desirable but obligatory. In 300 cases it was only once necessary to perform an amputation of the leg. The details of therapy in the handling of these cases is of great importance.

1. *Rest in Bed.*—This ensures that the legs are kept in the horizontal position. The patients should not be allowed to sit either on the edge of the bed or in a chair with the idea of obtaining some relief from pain. Sitting up results

in oedema of the feet, legs, and thighs. Patients should not be treated in extern departments.

2. *Smoking*.—Clinical experience has shown that smoking is unquestionably harmful in all stages of this disease. It has been shown by skin temperature changes in the extremities that peripheral vasoconstrictor action results from smoking. A healthy granulating ulcer may change its appearance over night if smoking is resumed. On the other hand, very favourable changes may be seen by the complete cessation of the use of tobacco; furthermore, there is usually a spectacular decrease in the intensity of pain.

3. *Intravenous Saline Injections*.—These are given in an attempt to lower the blood viscosity and thus improve the circulation in the extremities. Meyer is quoted as first using physiologic solution of sodium chloride by hypodermoclysis, but later changing to Ringer's solution. Samuels states that the solution must be hypertonic. He appears to make a case for the injection of these solutions and mentions that Ginsburg suggests the use of 2 per cent sodium citrate intravenously. [It has not been the experience of the reviewer that such solutions reduce the viscosity of the blood: on the contrary, he has found that their introduction in the preparation of patients for operation reduces the clotting time.—W. I. de C. W.]

4. *Local Treatment of Ulceration and Gangrene*.—The aim of local treatment is to aid in the development of the line of demarcation, to maintain the dead and dying tissue as aseptic as possible, and to control the pain. Pain is not an indication for amputation, but it may be severe for a few weeks: 1 gr. of codeine in twenty-four hours, supplemented by the local application of an anæsthetic ointment or solution, may be sufficient.

5. *Sympathectomy and Ganglionectomy*.—Samuels is dogmatic about these operations. He states that the operations have no place whatever in the treatment of gangrene or in any phase of thrombo-angiitis obliterans, as the spastic element in this disease plays such a minor rôle.

(See also THROMBO-ANGITIS OBLITERANS.)

Embolism.—The restoration of the circulation by the removal of an embolus blocking a main artery has been successfully accomplished in an increasing number of cases. Few surgeons have a large experience, and the literature for many years has dealt with isolated cases. A few cases are recorded as far back as 1905. In a review of the literature of 1922–32 Max Danzis⁶ mentions 129 cases. Affections of the heart and blood-vessels are the predisposing causes: 60 per cent of cases are purely of cardiac origin. Mitral disease is the most common cause of thrombus formation. The importance of early operation is stressed by most writers. Obviously, as pointed out by Danzis, the longer the period of occlusion, the more extensive and grave the alteration in the vascular lining. The embolus adheres very closely to the vessel wall, causing ulceration and ultimate necrosis at the obstructed point.

The removal of an embolus at a late date will be followed by complete obliteration of the arterial canal. Ligation of arteries is followed by a smaller percentage of gangrene than when obstruction is due to embolus. Gangrene more often follows embolic obstruction in the lower extremity than in the upper. The presence of arterial embolus may be suspected in a case with an organic heart lesion, with some form of systemic infection superimposed, when pain suddenly develops along the course of one of the vessels of the extremities, the pain being followed by a sense of coldness, numbness, and tingling, with progressive loss of motion. The skin becomes marble-like, cyanosis supervenes, and dark blue patches appear. Gangrene soon follows. There is, of course, absence of pulsation in the affected vessel below the obstruction.

Location of the embolus is not easy in deep-lying vessels, such as the

mid-portion of the femoral artery below Hunter's canal. If the collateral circulation is free, local manifestations may be at a considerable distance from the point of embolic obstruction.

When operation is contemplated local anaesthesia is sufficient if the artery is easily accessible. Spinal anaesthesia may be employed in deep-seated vessels of the lower extremity.

The technique of operation has been referred to in previous numbers of the *MEDICAL ANNUAL* (1934, p. 88). The artery is exposed and the location of the embolus is facilitated by noting the point at which pulsation stops. The obstructing clot can usually be palpated. The most common site is near an arterial bifurcation. The artery is isolated, a light rubber-covered clamp is applied to the vessel above. The vessels well below the site of obstruction are similarly controlled. The wound is saturated with 2 per cent sodium citrate solution. This solution is also used for the instruments and the surgeon's gloved hands. The incision in the vessel is made longitudinally, a little above the obstructing point. The vessel is opened and the clot is usually evacuated spontaneously with the aid of digital pressure. The finest needle and silk thread, dipped in sterile vaseline or sodium citrate solution, are used to suture the incision in the vessel wall.

Danzis gives a very exhaustive résumé of the literature on the subject of arterial embolectomy. He comes to the following conclusions: (1) Early recognition and prompt surgical intervention give best results. (2) The operation should be done under regional or spinal anaesthesia. (3) Much better results are obtained in operations on the vessels of the upper extremity than those of the lower. (4) Collateral circulation plays a very important part in the restoration of circulation, particularly in the vessels of the upper extremity. (5) Secondary emboli, or coexisting emboli at the time of operation, contribute largely to the high mortality. (6) Careful search should be made for other obstructive emboli or thrombi, above or below the primary embolus, before the incision in the artery is closed. (7) Advanced arteriosclerotic changes do not necessarily contra-indicate the operation, but the prognosis is not favourable even when the operation is done early. (8) It is doubtful whether the operation is indicated or justified in those patients who are suffering from a severe exacerbation of a subacute endocarditis, running a septic temperature, with a history of previous or associated embolic deposits. Very little may be gained from the operation in such cases. (9) Embolectomy is the only definite surgical therapeutic measure known to us at present for the relief of sudden circulatory obstruction by embolus.

A. Gosset, I. Bertrand, and J. Patel⁷ review the circumstances under which embolectomy and arteriectomy are being practised and the results which have been obtained from these procedures. They draw the following conclusions:—

1. All cases of peripheral arterial embolism are complications of a primary cardiovascular disease.

2. All emboli usually lodge in dangerous zones, at the level of major bifurcations of the arteries, or at the origin of large collateral arteries.

3. All emboli cause changes in the wall of the artery at the site of lodgement and then enlarge by causing further thrombosis.

4. All emboli that become lodged in peripheral arteries bring about complications, the course of which is variable but usually serious.

The principal object of surgical treatment is to re-establish the circulation and thus prevent or limit gangrene. Thrombotripsy is considered illogical and generally ineffective, and amputation should be done only after all conservative measures have failed.

The difficulty of localizing the site of lodgement of the embolus is emphasized.

Motor and sensory disturbances furnish only uncertain localizing signs. The oscillogram shows only gross changes. The most accurate information is obtained by palpation of the peripheral pulses and arteriography.

On the basis of a comparative study of the value of embolectomy and arteriectomy the authors summarize the disadvantages of embolectomy as follows:—

1. The technical difficulty of the operation.
2. The need for absolute asepsis.
3. The speed and accuracy with which the operation must be done.
4. The danger of damaging the intima of the artery during the operation.
5. The persistence of the diseased artery after the embolectomy, which may give rise to secondary thrombosis.

Obliteration of an artery causes changes in the nervous plexuses in the adventitia of the artery, and the repeated irritation causes, in the periphery, vasomotor disturbances, usually of the vasoconstrictor type, which may further embarrass the collateral circulation (Leriche). In two animals the authors were unable to note beneficial effects from periarterial sympathectomy or the chemical sympathectomy of Doppler.

The advantages of arteriectomy over embolectomy (arteriotomy) are summarized as follows:—

1. The operation is easy to perform.
2. There is no need for special surgical precautions.
3. Compression of the artery is not necessary, one cause of intravascular clotting or focus for abnormal vasomotor stimulation being therefore eliminated.

Clinical and experimental evidence is cited to show that arteriectomy may give excellent results.

There is some disagreement as to when arteriectomy is indicated. Grégoire believes that the embolus produces important lesions in the endothelium of the artery and thus predisposes to the formation of a new clot. Therefore he is of the opinion that the entire obliterated segment of the artery with its adventitia should be removed at once. Moure believes it is important only to remove the embolus which acts as the centre of intravascular clotting, and that consequently resection of a short segment, which includes the part of the artery damaged by the embolus, is sufficient. Useful collateral arteries are not disturbed by the local arteriectomy.

In conclusion, the authors state that embolectomy is indicated in cases in which the embolus has lodged at the bifurcation of the aorta, external iliac arteries, or similar large arteries. Arteriectomy is indicated in: (1) Cases in which it is necessary to act quickly because of the patient's poor general condition (Leriche); (2) Cases of embolectomy in which the endothelium of the artery appears greatly altered after the embolus has been removed (Leriche); (3) Cases in which local changes make proper suturing of the artery questionable (Moure); and (4) Cases of impending gangrene of the extremity in which embolectomy has failed to give relief.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1934, Feb., 287; ²*Ibid.* 1933, lvi, 8; ³*Ibid.* 11; ⁴*Lancet*, 1933, ii, Dec. 2, 1245; ⁵*Jour. Amer. Med. Assoc.* 1934, Feb. 10, 436; ⁶*Ann. of Surg.* 1933, Aug., 249, Sept., 422; ⁷*Jour. de Chir.*, 1933, xli, 1 (abstr. *Surg. Gynecol. and Obst.* 1933, Aug., 154).

BONE DECALCIFICATION.

E. W. Hey Groves, M.S., F.R.C.S.
K. H. Pridie, F.R.C.S.

The problems of bone growth and repair continue to become more intricate with our increasing knowledge of calcium metabolism and X-ray phenomena. But though it may be more difficult to understand all the factors which go to the influencing of the structure of bones, there are certain variations in structure

which can now be recognized and which have a most practical bearing upon diagnosis and treatment.

R. Watson Jones and R. E. Roberts¹ have contributed a most comprehensive article on decalcification, calcification, and ossification, which traverses a large part of the field of bone growth, atrophy, and repair. In their view calcification or ossification may take place in any connective tissue, provided there is a high blood-calcium content and an impaired vascularity. In bone itself any condition of diminished blood-supply will be followed by increased calcification. This is seen, for instance, in chronic inflammatory diseases, e.g., syphilis or the late stages of osteomyelitis. Conversely, an increased blood-supply to the bone leads to decalcification. This is seen most typically after infection or injury, especially when these affect the ends of the bones, near the joints, and the small bones of the carpus or tarsus. It is easy to understand how the hyperæmia associated with a tuberculous infection or a whitlow or that of an injury, e.g., a Colles's fracture, may lead to the decalcification of the carpal bones and the lower ends of the radius and ulna; but it is much more difficult to explain the atrophy of disuse on the same hypothesis. The ingenious but not very convincing theory in the paper referred to is that when a limb is immobilized and not used there is a relative hyperæmia of bone, because the blood-supply of the limb is much less taken up by the inactive muscles. The degree of decalcification in an inactive limb is much less than that due to infection or injury. Simple disuse, such as that associated with paralysis, shows very little decalcification, whereas disuse associated with injury shows a high degree.

From a practical point of view there are two points which are beyond dispute. The first is that when a limb (typically a wrist or ankle) is injured, rest to the injured part promotes recovery and tends to retain the bone structure; and, second, that functional activity during this period of fixation will prevent decalcification. Thus in a case of Colles's fracture there are two things necessary for rapid recovery: (1) Firm fixation of the lower end of the radius; and (2) Active use of the fingers and thumb during fixation. Two things will certainly lead to decalcification and to delayed recovery, namely: (1) Want of fixation, either inadequate splinting or frequent interruption of fixation by massage and passive movements; and (2) Excessive fixation of the whole hand so that the muscles cannot be used (*Plate VIII*).

Evidence of Necrosis of Bone.—The hyperæmia associated with any fracture always produces temporary decalcification of the bones at and near the site of fracture. If any portion of bone retains its original density, then this is proof that that fragment has been cut off from its blood-supply, and is devitalized (*Plate IX*). If this condition is of long standing, then the dense bone must be regarded as a sequestrum and removed. In an early stage, if the devitalized bone can be brought into apposition with neighbouring living bone and there fixed, it may become revitalized by the growth of new vessels into its substance.

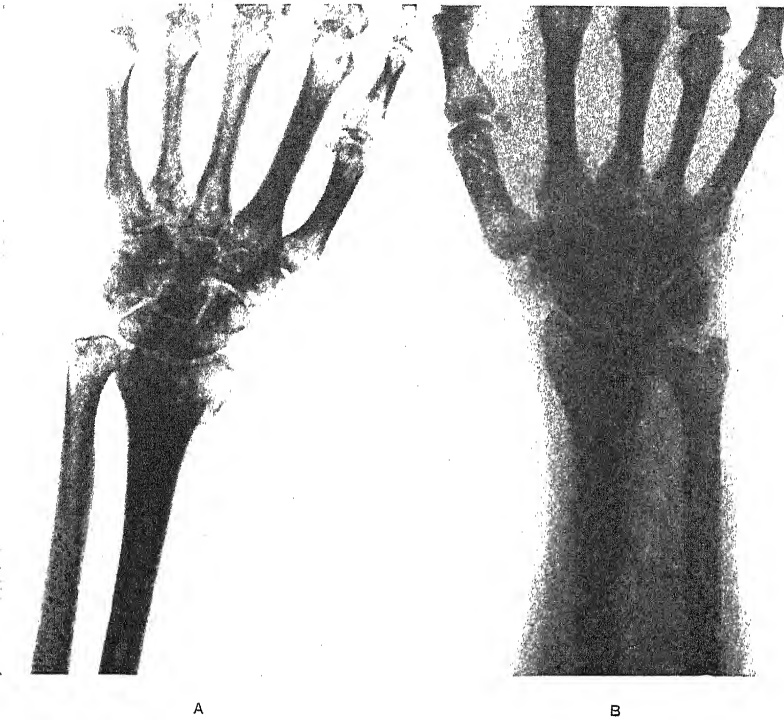
Post-traumatic Painful Osteoporosis.—The wrist or the ankle may be affected by well-marked decalcification associated with great pain and disability after comparatively trivial injuries without any fracture. This was first described by Sudeck² in 1900, and the condition is sometimes therefore called *Sudeck's disease*. It is of very great importance to recognize this condition so that it may be adequately treated, and especially so that it shall not be confused with tuberculosis—a mistake which has often been made with disastrous results.

Recent papers by F. B. Gurd³ and D. S. Middleton and J. Bruce⁴ deal very fully with this condition both in its theoretical and in its practical aspects. In

PLATE VIII

DECALCIFICATION OF BONE

(R. WATSON JONES AND R. E. ROBERTS)



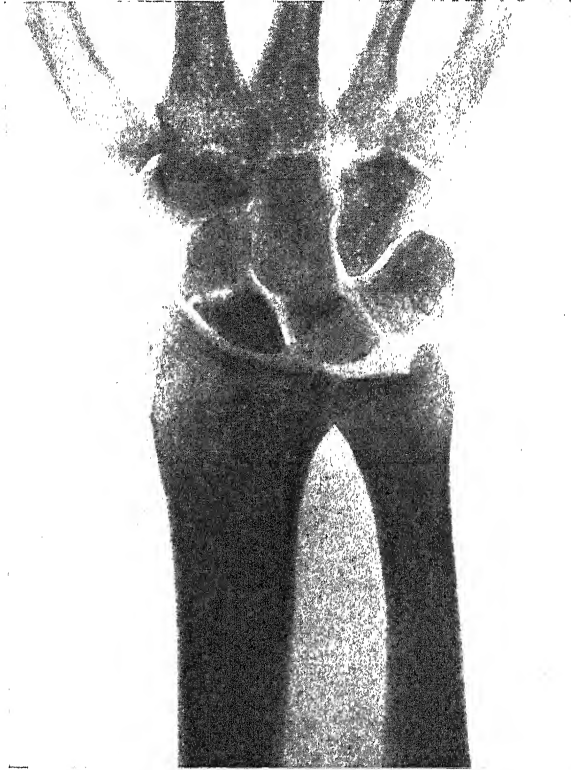
Disuse decalcification of bone. Two similar cases of Colles's fracture of the radius eight weeks after injury. A. In this case there has been excessive splintage and no functional activity; B. In this there has been full functional activity throughout.

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PLATE IX

DECALCIFICATION OF BONE—*continued*

(R. WATSON JONES AND R. E. ROBERTS)



Fracture of the carpal scaphoid with evidence of avascularity of the proximal half of the bone. The proximal half of the scaphoid is of normal density (cf. shafts of radius and ulna). Unlike the distal half and the other carpal and metacarpal bones, it has not undergone decalcification. It is therefore avascular.

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a typical case the wrist or ankle has had a trivial injury which is probably of the nature of a sprain. After some days the limb becomes very painful, swollen, with dusky glazed skin. The X rays show a remarkable degree of decalcification which is of exactly the same mottled patchy appearance as that shown in *Plate VIII*. There is almost complete loss of function, and the condition may continue for an indefinite period unless some effective treatment is undertaken.

A most extensive discussion has taken place as to the nature and treatment, and the salient points which emerge from this discussion may here be briefly summarized. The theories of its causation are two, the first that it is merely the result of the hyperæmia and decalcification which have been mentioned above. That both hyperæmia and decalcification occur is indubitable, but this theory does not explain why these phenomena should follow one sprain and not another, and it leaves out of account the striking nervous symptoms, the pain, the glazed skin, and other trophic signs. The second theory is one of nervous origin—that there is a reflex caused by the pain which produces vasodilatation and thus leads to decalcification. This at first sight seems a much more probable theory than that of simple vascular disturbance; but again we are faced with the difficulty of explaining how it is that sympathectomy should be effective in its relief, because this operation will promote rather than cure vasodilatation.

The important practical question, however, is how the condition should be treated. In the first place it must be distinguished from tuberculosis. This is done by observing three points: (1) The onset of the symptoms of pain and loss of function is much more rapid than in tubercle; (2) The pain is much greater and is not relieved by mere rest; and (3) In the X-ray the articular surfaces of the bones are unaffected, whereas in tubercle they suffer early erosion. Having made clear the diagnosis, the decision must be made as to fixation, exercise, physiotherapy, or sympathectomy.

It would seem quite unreasonable to regard this condition as a separate disease *sui generis*. In all respects it is identical with the condition associated with certain cases of Colles's or Pott's fracture. It must be an injury of the joint with tearing of ligaments but without actual breaking of the bone. Therefore, in the first place, treatment should be the same as for these more obvious injuries—that is to say, absolute fixation of the joint, combined with functional activity of the rest of the limb.

In the wrist, the hand should be fixed by a dorsal plaster splint reaching from the knuckles to the elbow, and the digits should be exercised in the ordinary movements of flexion and extension, whilst the elbow and shoulder are given appropriate active movements. In the ankle, the leg is placed in an unpadded plaster cast leaving the toes free on the dorsal aspect. A walking-iron (Böhler) is fixed to the cast, and the patient made to walk regularly every day. Physiotherapy has a very limited application. There is no justification for the use of massage and passive movements. These can only be applied if the fixing splint is removed, and this will be a fatal mistake. At a late period when the splint is removed (from a month to six weeks after the accident) hot air and diathermy are of use.

Lastly there comes the question of *sympathectomy*. Leriche and other Continental surgeons are enthusiastic about the value of this operation. English writers, such as Middleton and Bruce, speak in more guarded terms. It seems quite certain that a mere periarterial sympathectomy will produce a striking alleviation of pain, but this result is only of temporary effect. Probably the more drastic operation of ganglionectomy should be reserved for those intractable cases in which treatment by fixation and exercise has failed to bring about a

cure. We venture to think, however, that if fixation and functional activity are instituted at an early date and carried out efficiently, there will remain very few cases for the more radical operation.

REFERENCES.—*Brit. Jour. Surg.* 1934, xxi, Jan., 461; *Arch. f. klin. Chir.* 1900, lxi, 147; *Ann. of Surg.* 1934, xcix, March, 449; *Edin. Med. Jour.* 1934, May, 49.

BORNHOLM DISEASE. (See PLEURODYNIA, EPIDEMIC.)

BRAIN. (See also CEREBRAL; INTRACRANIAL; HEAD INJURIES.)

BRAIN, ABSCESS OF.

Geoffrey Jefferson, M.S., F.R.C.S.

The brain abscess is a problem which is not yet solved, and efforts are being made towards a more precise appreciation of its pathology and its life-history. H. Cairns and C. Donald¹ discuss a series of 30 cases, 13 of which were associated with middle-ear or mastoid disease. They point out that in cases associated with infections of the air sinuses or cranium it is customary to allow the cerebral exploration to be guided by the findings in the epidural and dural tissues. This they look upon as a grave error, and insist that the mode of attack should be pre-conceived, based on the findings of a complete neurological examination, which should include radiographic investigations and the charting of the visual fields.

The acute abscess is really a suppurative meningo-encephalitis, in which, unless a capsule is formed, surgical intervention can offer little hope. Adson has suggested that encapsulation has occurred when the septic temperature subsides, the lymphocytosis recedes to 12,000, and the neurological signs become more localized. H. P. Cahill,² of Boston, points out that the clinical picture may be obscured by septic meningitis, or by thrombosis of one of the larger venous sinuses. In septic meningitis the patient is anxious and irritable; bright and animated in sinus thrombosis; dull or stuporous in brain abscess.

In acute cases any overlying osteomyelitis is treated at once, provision being made for ample drainage of the extradural spaces, and the abscess is left until there are clinical indications of encapsulation. Drainage of the abscess may be accomplished by the closed method, when a non-collapsible catheter is passed along an exploratory brain cannula, or by the open method of uncapping the cortex through a minimum exposure, or by means of an osteoplastic flap.

The important points are: that the abscess with its loculi should be adequately drained at its most superficial point, with the tube running out at right angles to the cortex; to avoid damage to the capsule on its deep surface, with the danger of spread of infection into the contiguous brain tissue and the development of secondary abscesses; and to seal off securely the general cerebrospinal fluid spaces. Dandy disfavours drainage, and advocates repeated tapplings associated with a subtemporal decompression, which not only acts as a safety-valve for pressure but is an indicator for subsequent tapping.

The chronic abscess with thick walls presents a rather different problem, and cannot adequately be treated by drainage, because when the element of infection has been successfully dealt with, the fibrous capsule will rarely collapse, and in any case remains as an undesirable foreign body, the possible origin of an epileptico-genetic focus or a recurrent abscess. Such cases are best treated by complete excision as done by Cairns and Julian Taylor, and when this is impossible, by marsupialization with the ultimate expulsion of the capsule. Cases suitable for such treatment are unfortunately distinctly uncommon.

Post-operatively the general condition of the patient must be treated with care if good results are to be expected, and the minutiae of nursing must be closely observed, particularly in the feeding of stuporous patients to avoid the

possibility of aspiration pneumonia. Drainage tubes are liable to become blocked with dry exudate on gauze, so their ends are best protected with a piece of cellophane. Suction is deprecated because of the danger of injury to the ventricular walls. Great care is taken with the dressings, which are done infrequently, so as not to disturb the tubes, which are allowed to be slowly extruded over a course of several weeks by the gradual collapse of the abscess cavity.

Complications due to inadequate drainage, such as spreading encephalitis, septic meningitis via the general cerebrospinal fluid spaces or the ventricular system, and œdema are common, but with the development of a more accurate diagnosis as regards presence and position and a reasoned plan of attack, a more hopeful outlook may be entertained.

REFERENCES.—¹*Proc. Roy. Soc. Med.* (Sect. of Otol.), 1934, xxvii, Oct., 111. ²*Jour. Amer. Med. Assoc.*, 1934, Jan. 27, 273.

BRANCHIAL FISTULÆ. (See CYSTS AND FISTULÆ.)

BREAST, SURGERY OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Diffuse Hypertrophy of the Breasts in Girls.—The condition is not frequently seen, and is much more common abroad than in this country. It produces a deformity of which the patients are sensitive and conscious.

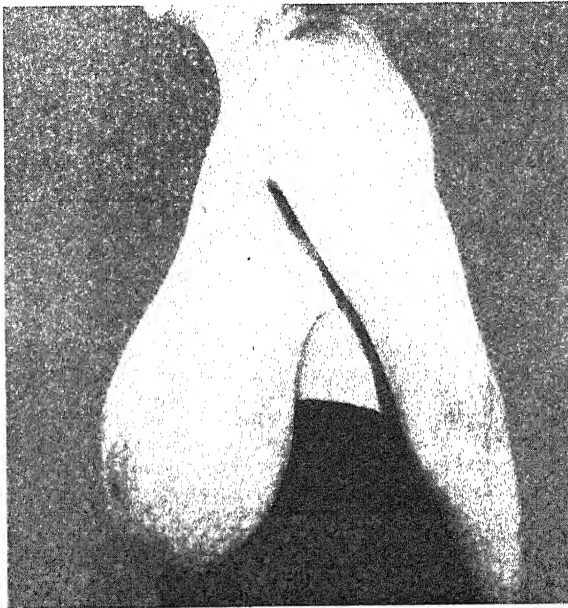


Fig. 8.—Hypertrophy of the breast. (By kind permission of the 'Practitioner'.)

Furthermore, the breasts are functionally useless and cause embarrassment and inconvenience. Amputation is the treatment of choice: for cosmetic reasons the nipple may be removed by a circular incision round the areola and transplanted into the centre of the stump left after the amputation.

C. P. G. Wakeley¹ deals with this subject. He states that it is quite a mistake to say that the hypertrophy is due solely to fat and fibrous tissue. In the four cases under his care, local amputation was carried out; serial sections of the organs proved that there was an increase of the gland substance of the breast in each case. He thinks that the condition may be due to some endocrine disturbance and does not approve of transplantation of the enlarged nipple after amputation. The breasts are removed by transverse elliptical incisions which are united to form a transverse scar. This does not show when evening dress is worn, and lies in one of the natural folds of the skin over the chest. The main blood-supply of the breast comes from the external mammary, a branch of the axillary artery; bleeding can be adequately controlled by making the upper part of the elliptical incision first. The main vessels are exposed and clamped, and when the lower part of the incision is made there is practically no bleeding whatever. The accompanying photograph of Wakeley's third case is a good illustration of the condition (Fig. 8).

Asymmetrical Breasts.—J. W. Maliniak² discusses asymmetrical breast deformities. They may be due to unilateral hypertrophy with the opposite side normal, or to bilateral asymmetrical hypertrophy. The latter is the commoner type and occurs in young girls as well as married women. Surgical reconstruction is more elaborate in unilateral cases because of the necessity to make the deformed breast correspond in size and position to the opposite side.

Tuberculosis of the Breast.—This is a relatively uncommon condition and was not recognized prior to Sir Astley Cooper's observations in 1829. W. E. Lee and W. R. Floyd³ discuss the pathology, symptoms, and diagnosis of the condition. There is usually a painless lump in the breast, slow in growth, which goes on to abscess, rupture, and sinus formation. Tuberculosis usually occurs at a younger age than carcinoma, but the differential diagnosis must be carefully considered. The treatment consists in surgical removal of the lesion. Proven tuberculosis does not undergo a spontaneous retrogression. The prognosis with appropriate treatment is excellent, as the general health of the patient is nearly always good. This is not true of secondary tuberculosis.

Chronic Mastitis.—B. Whitehouse⁴ believes that a so-called chronic mastitis is essentially a disorder of function in the non-lactating mammary gland. He states that the term 'chronic mastitis' should definitely and finally be relegated to the lumber room of a discarded phraseology. Max Cutler agrees with this view. He has stated that the grouping together of lesions that are essentially physiological, and therefore innocent, with lesions that are pathological and precancerous has led to the greatest confusion. This authority believes that at least 20 per cent of carcinomata have passed through the cystic and papillomatous stage.

Cystic Diseases of the Breast.—It is well to emphasize that cyst formation in the breast is found in two definitely different types of cases. In the one the cyst formation predominates and in the other epithelial hyperplasia is a striking characteristic. The latter form is commonly known as Schimmelbusch's disease, but was described by the old writers such as Astley Cooper and Velpeau. This type of cystic breasts must be considered potentially cancerous. The recognition and study of precancerous conditions in the breast is the only hope of the future. The difficulties appear great, especially when it is remembered that fifty experienced pathologists, at the instance of Bloodgood, were not able to agree in a single case regarding the significance of the microscopic picture in ten lesions of the breast known to be clinically benign.

H. H. Trout⁵ deals with these questions. The history of his cases does not reveal any definite association between chronic cystic mastitis and carcinoma.

Tumours of the Male Breast.—J. T. Moore⁶ thinks that carcinoma is so frequently found in various tumours of a male breast that he advocates early removal of any tumour. The removal should be radical, and post-operative radiotherapy should be employed.

Cancer of the Breast.—Sir Lenthal Cheate⁷ points out that breast cancers are discovered when in an advanced stage quite accidentally by the patient. Under such circumstances the disease cannot be eradicated by any known form of treatment. He cannot see how this type can be saved unless all women over thirty years of age undergo periodical examinations. He emphasizes, however, an important point—i.e., that certain cases of so-called chronic mastitis are potentially cancer. The cases alluded to are those in which there is a localized hard, solid, or partly cystic collection of rounded nodularities with defined margins. There are no enlarged lymphatic glands, and there is no adherence of the tumour to the skin. The area may be small or it may be extensive and triangular in shape, with its apex towards the nipple; but it is localized to only one part of the breast. This is an early carcinoma in most instances.

The malignant cells may be found: (1) in a few terminal ducts and acini, (2) in a solitary tumour of the chief duct, (3) in the whole course of the chief duct or ducts, or (4) all the ducts and acini of the breast may be in a malignant state. Probably No. 2, the duct carcinoma, is the least malignant of the four.

Cheate gives his well-known views on the so-called chronic mastitis. First of all it is not an inflammation, nor is it precancerous. It is more the physiological state found in most breasts at birth, at puberty, and in most women over the age of 35. After the menopause it often spontaneously ceases. It never forms cysts. He objects to the term 'chronic cystic mastitis', and describes the pathology. It is often a precancerous condition and the small cysts appear to be more dangerous than the larger ones. [The reviewer has confirmed the opinion of Cheate that the so-called 'chronic cystic mastitis' may be a precursor of carcinoma.—W. I. de C. W.]

TREATMENT.—D. C. L. Fitzwilliams⁸ deals with the modern treatment of carcinoma of the breast. He divides the operable cases into extrathoracic and intrathoracic. Treatment can have no direct influence upon intrathoracic cancer except feebly by X rays; these cases are doomed and hopeless from the first. Fitzwilliams thinks that there is nothing more dramatic in surgery than the action of radium upon metastases. Small ones disappear in a week, and the larger ones take three weeks. Many of these cases can be kept alive and well for a great number of years.

Ulcerating growths are some of the most satisfactory cases for treatment with radium. In the end the patient dies from internal metastases, but the latter part of her life is made infinitely more happy. It is doubtful if inoperable carcinoma can ever become operable following irradiation treatment. In the advanced but operable case we have not reached the stage where we can say that these cases are suitable for treatment by radium alone. They are usually submitted to a radical operation. A high proportion of these cases show a rapid recurrence. The operation in such cases sometimes does harm and shortens life. According to Fitzwilliams, nothing is gained by the use of the diathermy knife in an attempt to seal the lymphatics. Radium should be introduced at the time of the operation and applied widely when the wound is healed in order to sterilize the cells which have been liberated during operation.

In the moderately early cases of cancer the skin is only slightly adherent and only small but doubtful glands can be felt in the axilla. In such cases it is a difficult problem to decide whether to employ treatment by the knife

or by radium: no definite conclusion has yet been propounded in favour of radium. It is urged against operation that the breast, although shrunken and shrivelled, is preserved. Certain cases are quite unsuitable for radium, such as extensive tumours more than three inches in diameter and tumours in stout people. Conversely small tumours in thin people are eminently suitable for such treatment.

Early Cases.—When the diagnosis is made and the presence of malignancy suspected, a radical operation should be performed at once, assisted by the use of radium at the time of operation and subsequently.

End-results of Treatment.—R. B. Greenough and S. W. Taylor⁹ discuss end-results following treatment of any cancer of the breast. In 167 cases 40.9 per cent were living without evidence of disease from five to nine years after operation. When the disease was confined to the breast, the percentage was 64. When the disease had extended to the axillary glands the percentage was 26. They state that exploratory incision, if carefully performed, does not disseminate the disease. Exploration should not be undertaken, however, unless facilities for a frozen section diagnosis and for the completion of the radical operation at the same time are available. Finally, they conclude that over 11 per cent of cases living without evidence of disease five years after operation will subsequently die of recurrence. Definite conclusions in regard to the value of post-operative prophylactic X rays are not justified.

(See also X-RAY AND RADIUM THERAPY.)

REFERENCES.—¹*Practitioner*, 1934, May, 608; ²*Ann. of Surg.* 1934, May, 743; ³*Ibid.* 753; ⁴*Surg. Gynecol. and Obst.* 1934, Feb., 278; ⁵*Amer. Jour. Surg.* 1934, May, 258; ⁶*Ibid.* 305; ⁷*Newcastle Med. Jour.* 1934, April, 59; ⁸*Practitioner*, 1934, May, 596; ⁹*New Eng. Jour. Med.* 1934, April, 831.

BRILL'S DISEASE. (See TYPHUS FEVER.)

BRONCHIECTASIS.

J. F. Gaskell, M.A., M.D., F.R.C.P.

ETIOLOGY.—R. Debré and E. Gilbrin¹ bring forward reasons for supposing that all bronchiectases are congenital in origin. They base this hypothesis on a study of gas-containing cysts of the lung. They hold that these cysts are all derived from malformations of bronchi, and those observed in childhood are monstrous perversions of a not uncommon condition which only becomes manifest when secondarily infected. Their arguments are not convincing and their observations can be otherwise interpreted.

Upper-lobe Bronchiectasis.—E. H. Rubin and H. S. Newman² draw attention to the not infrequent occurrence of upper-lobe bronchiectasis without the presence of active tuberculosis. They describe 8 cases of their own observed in the Montefiore Hospital, New York, and collect 6 others from the literature. While they allow that tuberculosis may be the initial cause of the condition and give illustrative cases to show this, they insist that the condition should be looked upon as a separate clinical entity. The differential diagnosis is from chronic tuberculosis, and X-ray appearances are of little help, for the bronchial dilatations simulate chronic tuberculous cavities. At autopsy these dilatations lying in a fibrosed lung are almost invariably accompanied by peripheral emphysematous blebs, which are perhaps bronchiectasis of peripheral bronchioles. The latter may occasionally be seen by X rays. The clinical signs are the best differential guide to the condition. Though they seldom show the characteristic signs of lower-lobe bronchiectases—profuse expectoration of fetid sputum, clubbing of fingers, and bouts of fever—possibly owing to the better drainage of the upper lobe—certain of them are distinctive: (1) Resonance above the clavicle, first described by Fishberg, possibly due to the emphysematous bullæ; (2) Lack of signs of apical shrinkage—there may

even be bulging of the chest wall; (3) Absence of tubercle bacilli in the sputum with repeated examinations. The authors have found that 99 per cent of a large series of cases of tuberculosis show positive sputum in one of three examinations if carefully made; three or more negative examinations of this kind therefore almost certainly exclude active tuberculosis. They conclude that the condition is of clinical importance and will be found to be much commoner than supposed. Its prognosis is quite different from that of chronic fibroid phthisis.

TREATMENT.—F. C. Roles and G. S. Todd³ have studied 106 cases at the Brompton Hospital over a period of three to six years and have compared the results of medical and surgical treatment in the series. They consider the dry symptomless form, which X-ray examination with lipiodol has lately brought into prominence, an early stage of the suppurative form; and produce reasons to urge radical operation at this stage before the inevitable suppurative stage is reached. They find that in cases treated medically the mortality is greater than in the surgical cases, even in their comparatively short period of observation, and that the spread of disease is inevitable, with final bilateral involvement. Cases pass through the various fusiform stages to become finally saccular. This applies also to the 'dry' cases; of 14 observed in the dry series, 10 became septic, 3 of which died and 2 became totally incapacitated. Surgical results were much more encouraging. Of the various methods artificial pneumothorax is helpful but never causes closure of the cavities, and with re-expansion of the lobe the condition always returns. It should only be used as a preliminary to lobectomy to control spread of the condition. Phrenic avulsion may produce striking temporary results, but when the diaphragm is reduced to a functionless sheet the condition becomes worse than ever and must be followed by other measures. Thoracoplasty occasionally helps, especially in cases with extensive unilateral involvement; rib removal should be radical. Suppurative cases have become dry after this operation. It should never be used for lesions limited to one lobe. Lobectomy is the operation of choice and should be performed in the early stages.

The diagnosis of the condition in the early stages depends entirely on lipiodol examination, and all cases with sputum persistently negative for tubercle bacilli with cough and hæmoptysis should be thus examined. Fixation of the diaphragm is often found, and if observed in a routine X-ray examination a lipiodol examination should always be made.

Girbal⁴ advocates an unspecified vaccine therapy, combined with intravenous injections of alcohol and lung extract by mouth, as a sound medical treatment of bronchiectasis, and claims to prevent febrile exacerbations and to control the suppurative process by this means.

REFERENCES.—¹*Presse méd.* 1934, xlii, July 11, 1113; ²*Amer. Jour. Med. Sci.* 1933, Nov., 650; ³*Brit. Med. Jour.* 1933, Oct. 7, 639; ⁴*Presse méd.* 1934, Jan. 20, 111.

BRONCHIECTASIS: SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

Lobectomy.—Reports are now being published of series of cases of unilobar bronchiectasis treated by radical measures—namely, lobectomy. Three of these reports consist of results obtained by the so-called 'one-stage' method. R. M. Janes¹ records a series operated upon by a method first employed by Brunn and then modified by Shenstone. A good account of the technique is included (the treatment of the pedicle is shown in *Plate X*) and a series of 17 cases is summarized: 17 patients were operated upon, 16 being done by the one-stage method; of these 16, 6 were cured, 3 improved, 2 unimproved, and 5 died. Improvement only—as distinct from cure—was

accounted for in one case by the failure to recognize involvement of the lower portion of the upper lobe on the same side; in another, by the presence before operation, or possibly the development after operation, of some disease in the opposite lobe. One case developed a post-operative collapse of a previously healthy lower lobe, which subsequently developed into definite bronchiectasis. The 2 unimproved cases were more extensive than was realized before operation. Of the 5 patients who died, death resulted in 2 of them from bronchopneumonia in the previously normal lung on the opposite side. Another autopsy revealed bronchopneumonia, pericarditis, and bronchiectasis of the remaining portion of the left upper lobe and right lower lobe. The fourth patient died of secondary hæmorrhage from a perforating branch of the internal mammary artery three weeks after a persistent bronchial fistula had been closed apparently successfully by a plastic operation. The fifth patient died of cerebral abscess fifty-two days after operation. A review of this series of cases has demonstrated that cases with persistent fever and those recently recovered from exacerbations of the disease are unsuitable for operation. Patients having a large amount of sputum should carry out postural drainage for some time before operation, and operation is better performed in the later than in the earlier part of the morning.

The second group of cases is reported by J. E. H. Roberts and H. P. Nelson.² This consists of 10 cases treated by lobectomy. Pleural adhesions were found between the base of the lung and the diaphragm in 2 cases, completely surrounding the affected lobe only in 5 cases, and with both lobes involved in 2 cases. The pedicle is controlled as in the Shenstone technique but by a modified tourniquet, and in other respects the operation is carried out according to the same technique, the stump being sutured by two continuous sutures. The phrenic nerve is crushed on the pericardium as soon as it is seen. Posterior drainage is carried out by a periosteal resection of a portion of the ninth rib. As regards post-operative complications, the authors record primary hæmorrhage in 2 cases, in one of which a spurting vessel was found on exploration; secondary hæmorrhage occurred in 1 case; 3 cases developed basal empyema. Infection of the chest wall was encountered likewise in 3 cases. Subphrenic abscess occurred in 1 case and was due to injury of the diaphragm at the time of operation. Bronchopneumonia developed in 1 patient only. Bronchial fistula resulted in 5 cases, and in 1 patient death was due to cerebral abscess. The predominant symptoms for which lobectomy was performed were cough and foul sputum in 6 cases and repeated hæmoptysis in the other 4. The operation was performed for bronchiectasis in 8 cases and primary bronchial carcinoma (*Plate XI*) in 2 cases. Two died subsequently to operation—one from cerebral abscess ten days later, and one from influenza and pneumonia three months after operation. Six healed without symptoms.

A. Tudor Edwards and C. Price Thomas³ report a series of 57 patients submitted to lobectomy for bronchiectasis. Variations in technique from the former groups consist in the control of the stump by a series of mattress sutures and the application of arsenic compounds such as novarsenobenzol to the surface of the stump before over-sewing, and the cauterization of the mucous membrane of the open bronchi of the stump with silver nitrate solution. Pre-operative treatment consisted of postural drainage; the administration of an autogenous vaccine; complete examination of the upper air-passages, including sinuses and teeth; and, where possible, the induction of artificial pneumothorax. Bronchial fistula was relatively common and is not of any particular significance, for in all except one case the bronchial fistula has not persisted longer than three months. Phrenic evulsion before or at operation was not advised as it might limit expansion of the remaining lobe. As a late post-operative

PLATE X
PULMONARY LOBECTOMY
(R. M. JAMES)

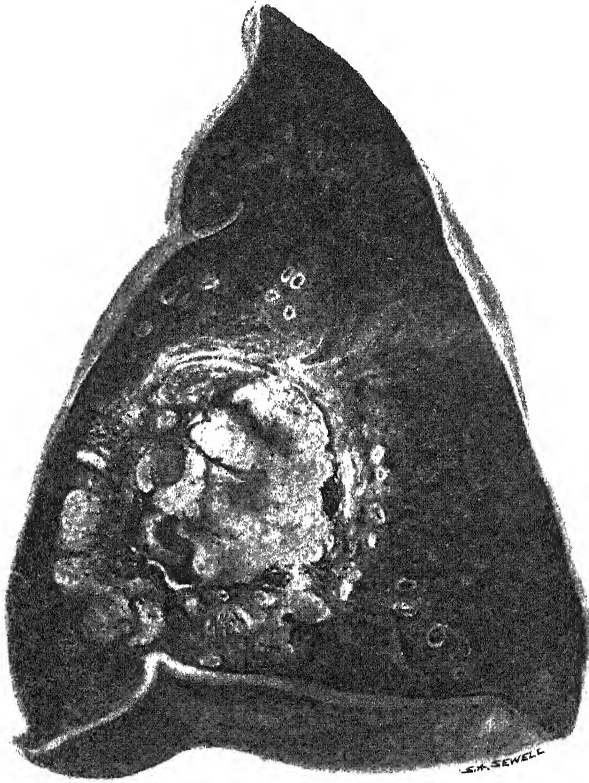


Closure of pedicle and its subsequent suture to the upper lobe.

PLATE XI

PULMONARY LOBECTOMY—*continued*

(J. E. H. ROBERTS AND H. P. NELSON)



Section of right lower lobe showing a squamous-celled carcinoma.

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PLATE XII

PULMONARY LOBECTOMY—*continued*

(A. TUDOR EDWARDS AND C. PRICE THOMAS)

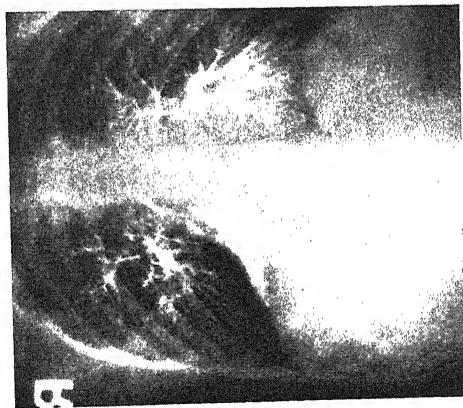


Fig. A.—Bronchogram showing area of bronchiectasis which comprises whole of lower lobe. Note the contraction in size and the relative expansion of the upper lobe.

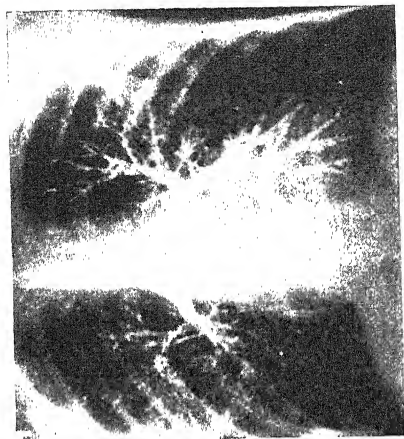
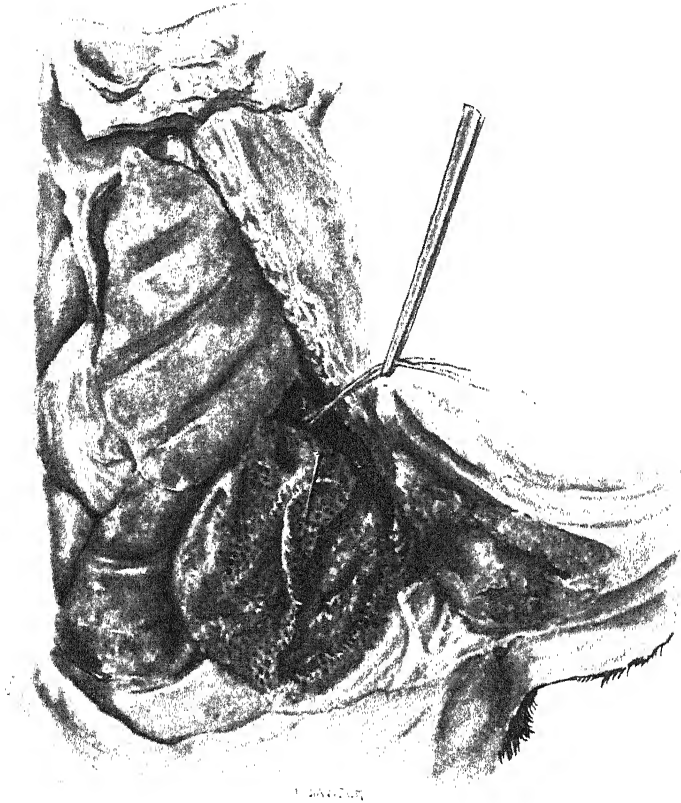


Fig. B.—Bronchogram of same case after lobectomy.

PLATE XIII

PULMONARY LOBECTOMY—*continued*

(A. GRAHAM BRYCE.)



Gangrenous left lower lobe of cat. Drawing made from the animal, which died four days after the second-stage operation. The figure shows the condition which in six other animals was compatible with recovery. See key figure on p. 65.

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measure to close residual empyema cavities phrenicectomy was performed in 8 patients and produced successful results in 7 of these. Of the main group of 48 cases, 23 were men and 25 women. Lower lobes were involved (*Plate XII*) in 47 patients, and the left upper lobe in 1; the right lung was affected in 14, 1 case was bilateral, and in the remainder the left side was involved. In 2 patients the right middle and lower lobes were removed. Six patients were over 40 years old, the youngest was 9 and the eldest 49. The operation was performed for hæmorrhage as a main symptom in 11 patients and for foetid purulent expectoration in the remainder, although a further 20 of these also had occasional hæmorrhage.

In this series 8 patients out of 57 died subsequent to operation, 5 within the first week and 3 later, giving a mortality, early and late, of 14 per cent. Of these 57 cases, 48 have been discharged from hospital at varying periods

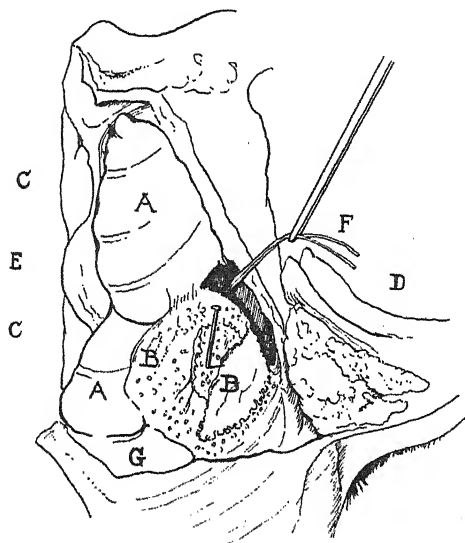


Fig. 9.—Key to *Plate XIII*. A, Left upper lobe; B, Left lower lobe—a portion of the net bag covering has been turned aside to expose the gangrenous lung tissue; C, Right lung; D, Portion of adherent thoracic wall turned aside; E, Pericardium; F, Ligature round pedicle of left lower lobe; G, Diaphragm.

from five years to a few weeks, and, with the exception of one patient, completely healed. This patient had a small residual empyema cavity with a persistent bronchial fistula of over a year's duration. Six of the remaining 40 patients still have some residual symptoms, all of a much diminished degree. Thirty-five were healed and symptomless, including one patient in whom malignant changes were found at the hilum of the bronchiectatic lobe.

Experimental Lobectomy: Separation of Adherent Lung by Inducing Necrosis.

—As regards experimental work in connection with lobectomy, A. G. Bryce⁴ has carried out a series of operations on animals with the idea of determining the effect of producing gangrene of the lobe *in situ* by ligation of its pedicle (*Plate XIII* and *Fig. 9*) and the removal at varying intervals of the dead tissue from its living surroundings. This experimental work supports the suggestion that it would be possible to remove densely adherent lung by

cutting off its blood-supply and allowing it to slough, the extraction of the dead lung being deferred until it had separated by the formation of a line of demarcation between it and its surroundings.

Although it is quite impossible to imitate in animals the pathological conditions found in disease in man, there is no doubt that the measures worked out here are applicable. Whether the adherent lung will separate itself from the chest wall if the main blood-supply is cut off at the hilum has not yet been decided. It is quite possible that adventitious vessels from the chest wall could maintain a sufficient blood-supply for the peripheral portions of the lung. The relative ease, however, with which the individual will retain a whole lung which is gangrenous is proved by the case of total pneumonectomy reported by C. Haight.⁵ In this case, after a relatively poor result from a multiple-stage thoracoplasty, he performed thoracotomy, tied off the hila of the upper and lower left lobes, and closed the chest with air-tight drainage. The chest was reopened on the fourth day and repacked. On the sixteenth day the upper lobe was found lying loose in the wound, and the lower lobe was found in a similar state on the following day. Healing then occurred rapidly and the residual bronchial fistula was healed in nine and a half weeks. In spite of the subsequent development of an abscess in the opposite lung three months later, the patient was well and without symptoms. This result in a case of unilateral, as contrasted with unilobar, disease is stimulating and would indicate an opportunity of relief for those bronchiectatic subjects who have derived only moderate relief from thoracoplasty.

REFERENCES.—¹*Brit. Jour. Surg.* 1933, Oct., 257; ²*Ibid.* 277; ³*Ibid.* 1934, Oct., 310; ⁴*Ibid.* April, 560; ⁵*Surg. Gynecol. and Obst.* 1934, lviii, April, 768.

BRUCELLA ABORTUS INFECTIONS. (See UNDULANT FEVER.)

BURNS. (See also ELECTRICAL INJURIES.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

TREATMENT.—Some original and interesting observations are still appearing in the literature on the *tannic acid* treatment of burns. D. R. Wells¹ states that instead of putting an extensively burnt patient into a tent heated by electric lights and spraying him with tannic acid, it is better to place him immediately in a tub filled with warm tannic acid solution. The percentage of solution is not calculated. Enough tannic acid is used to give the water a good muddy colour. Fresh water is run in and the solution drained out continuously, a comfortable temperature being always maintained and more tannic acid powder added from time to time. The patients experience such a relief that they readily co-operate. The solution penetrates, loosens, and elevates the destroyed tissue. Gross tags of full-thickness skin are painlessly removed with forceps and scissors. When the tub becomes badly fouled it is drained, quickly cleaned, and immediately refilled with fresh solution of tannic acid. Wells remarks in this paper: "this is not work for a nurse in a starched uniform, an intern who knows only how to write orders, or a surgeon in his evening clothes."

The cleansing often occupies three hours. By the time the patient is clean and ready to leave the tub the tan is already established. He is transferred from the tub to a warm room, placed on a dry bed, and is kept absolutely dry with a continuous draft of warm air from one or more large commercial hair-driers. For about seventy-two hours afterwards the burnt areas are more or less continuously sprayed with a 5 per cent solution of tannic acid. They are immediately and thoroughly dried with the blower.

R. M. Penick² also discusses the treatment of burns. He says that as much

as 70 per cent of the total blood volume may be lost through the burned area in twenty-four hours; hence the indication for the administration of fluid, preferably saline and glucose, by every available channel.

The Germicidal Effects of Tannic Acid.—J. D. Martin and C. D. Fowler³ state that there are no germicidal effects in the strengths of tannic acid (2 and 5 per cent) used in treating burns. Solutions of 10 and 20 per cent are bactericidal, so it would seem logical to use the latter. The more concentrated solutions, however, are highly astringent and tend to cause swelling and œdema of the tissues and too rapid fixation of the tannin. Antiseptics may be added with advantage to the weaker tannic acid solutions, e.g., with the addition of 1-10,000 bichloride of mercury all organisms are killed within twenty-four hours.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, Oct. 7, 1136; ²*Surg. Gynecol. and Obst.* 1933, Aug., 159; ³*Ann. of Surg.*, 1934, June, 993.

CANCER.

Stanford Cade, F.R.C.S.

In compiling a review of the work on cancer during the year 1934, priority of place must be given to the Fourth International Congress of Radiology held in Zurich.¹ The reports of this congress include general considerations of cancer as well as special problems of radiation, and give a résumé of the work done during the previous three years in all countries of the world. Their study is more important than any individual contribution in the literature. In addition to these reports the following can be mentioned as the most valuable publications of the year in this country: the Reports of the Medical Research Council on the Medical Uses of Radium² (1933), the preliminary report on Radium Treatment in Cancer in Certain Sites as an appendix to the fifth Annual Report of the National Radium Commission³ (1934), and the eleventh Annual Report of the British Empire Cancer Campaign⁴ (1934). In all, advances in treatment, estimation of the value of present-day methods, and indications as to changes of opinion in relation to therapeutic efficacy are indicated on broad lines. Individual contributors are concerned chiefly with questions of diagnosis, improvement of technique, and chemical treatment.

For a clear presentation of these various aspects of the cancer problem this review is subdivided into four main groups: (1) General considerations; (2) Radium therapy; (3) Aids to diagnosis; (4) Chemotherapy.

1. GENERAL CONSIDERATIONS.

Increased Mortality and Incidence of Cancer.—Various authors are of the opinion that there has been a general increase in the incidence of cancer since the beginning of the present century. This increase is accompanied by a corresponding rise in the death-rate from cancer. Various explanations have been given of this statistical evidence of increase, such as improved methods of diagnosis and more accurate records of death certification. It is, however, a matter of importance to the public as well as to the profession that the true state of things be ascertained. An attempt to elucidate this problem is made by Col. A. B. Smallman, of the Ministry of Health.¹ In a report on the subject he produces evidence which is very convincing. It is a recognized fact that the population of England and Wales contains to-day a greater proportion of old people and of females than it did a generation ago. Since cancer chiefly affects persons of the higher ages and is more common among females than males, a higher death-rate per million of the population is to be anticipated from these two factors. The crude death-rate from cancer between 1901 and 1932 shows a rise of 116 per cent in males and 55 per cent in females. But when the increase of the female population and increased longevity are

taken into consideration this crude death-rate is reduced to the standardized death-rate, showing an increase of 4.1 per cent in males and 2 per cent in females. The increase of cancer as a cause of death is therefore an absolute fact, but the actual increase is only seen from the standardized death-rate and is smaller than the crude death-rate seems to show. In comparing the crude death-rates in various countries, England and Wales have the unenviable distinction of occupying second place, with a crude death-rate of 116 per 1000 deaths from all causes; the highest figure is 121 per 1000 in Switzerland and Holland, the lowest 70.1 per 1000 in Japan.

Proportional Frequency of Cancer in Individual Organs.—The total increase of incidence and of mortality of cancer is due to the rising rate in some organs. Taking into consideration improved diagnosis and more accurate certification of death, there is still a net increase in some anatomical situations and a decrease in others. This is a true change in incidence and not entirely dependent upon improved methods of treatment in some sites. It can be definitely stated that cancer is on the increase in the following sites: oesophagus, lungs, intestine, pancreas, gall-bladder, stomach, rectum, prostate, ovary and Fallopian tubes, and breast. Cancer is on the decrease in the liver, uterus, lip, and penis. The increase appears to be universal. F. L. Hoffman⁵ shows this increase in the United States, and concludes that cancer is now the second leading cause of death. In fifty American cities with an aggregate population of 32 million in 1933 there have been 722,274 deaths from cancer since 1906, the rate increasing from 71.6 per 100,000 of population in 1906 to 100.2 in 1920, and rising to 124.7 in 1933. The lowest mortality of cancer on record is that of Egypt, where it is 0.77 per cent of all deaths. M. Ahmed Afifi, Director of X-rays Department of the Alexandria Government Hospital, draws attention to these low figures, points out the large proportion of bladder cancer due to bilharziasis, and believes that the tenets of the Mohammedan religion are of importance in the control of cancer incidence. These are: circumcision, ablution and general hygiene, abstinence from alcohol, occasional fasting and at all times moderation, the movements of the body in connection with Mohammedan prayers, the avoidance of suppression of lactation, the avoidance of coitus during and soon after menstruation, and, in general, the healthy life of the agricultural population of Egypt. If the statistical evidence is reliable, it would be interesting to study the incidence of cancer in Egypt with the increasing cosmopolitan habits which are gradually replacing strict Mohammedanism.

Prevention of Cancer.—W. Cramer⁶ discusses the possibility of prevention in cancer. He considers that the two main factors responsible for the development of malignant disease are: an *intrinsic factor* of susceptibility and an *extrinsic factor* of chronic irritation or stimulation. These two factors are illustrated by occupational cancer on the one hand, where the disease is the direct result of a specific extrinsic factor, and on the other hand by the rare but authenticated cases of cancer in twins affecting the same organ in both. It is clear that prevention of cancer in highly susceptible people is in practice impossible, but the known extrinsic factor responsible for certain occupational cancers offers definite opportunities of study. Prevention, therefore, must begin in the identification of unknown extrinsic factors responsible for the bulk of the incidence of the disease in man. Comparisons of site incidence in different groups of population, between men and women of the same country, or individuals of the same sex in different countries show wide differences. Cramer gives the following table (*Table I*) which is concerned with the difference of organ incidence in England and Bavaria, both countries having reliable statistics:—

Table I.—PERCENTAGE OF ORGAN INCIDENCE IN THE TOTAL CANCER MORTALITY—
ENGLAND AND BAVARIA (*Cramer*).

SITE OF CANCER	BAVARIA		ENGLAND	
	M.	F.	M.	F.
Stomach	55.8	42.3	22.2	16.6
Intestine	6.9	5.7	12.7	14.3
Rectum	8.3	4.3	10.3	6.0
Liver	6.8	8.0	6.0	7.2
Œsophagus	4.1	4.0	6.4	1.9
Tongue	0.5	0.1	4.6	0.4
Breast	—	9.2	—	19.4
Uterus	—	14.2	—	15.0

From this table it is clear that whereas the incidence of uterine cancer is nearly the same in both countries, breast cancer is very much more frequent in England, and the reverse is the case for cancer of the stomach. An analysis of the incidence of cancer of the stomach in different social classes in England shows that the lower the social scale the greater the incidence. This indicates that the stomach is exposed in certain social classes to conditions which lead to cancer but which are avoided to a large extent by the upper social classes. A striking instance of the importance of the extrinsic factor in organ incidence quoted by Cramer is the variation in incidence of cancer of the stomach and cancer of the liver in Javanese and Chinese coolies in Sumatra (*Table II*).

Table II.—LIVER AND STOMACH CANCER IN JAVANESE AND CHINESE COOLIES (*Cramer*).

		NO. OF CANCER CASES	LIVER CANCER	STOMACH CANCER
			Per Cent	Per Cent
Javanese ..	101		55	1
Chinese ..	75		28	19

The almost complete absence of gastric cancer among the Javanese as compared with the Chinese indicates the presence of some external factor the recognition of which might give valuable information on the etiology of gastric cancer and might help to establish a prophylaxis of cancer of the stomach. Cramer concludes that clinical investigation into the detailed history of patients is indicated with reasonable expectation of success.

Hereditary Factors in the Etiology of Cancer.—C. A. Joll⁷ states that the investigations of the past twenty years indicate that susceptibility to cancer in man is undoubtedly inherited; no facts are available to make it possible to minimize this susceptibility. One or two instances in human pathology indicate that malignant growths can be transmitted as simple gene dominants; well-known instances are: glioma of the retina, multiple neurofibromata, and polyposis of the colon. Maude Slye's⁸ work on mice provides evidence that certain spontaneous tumours of the breast have a tendency to be inherited as Mendelian recessives. Instances of malignant disease of the testis in identical twins have been published by H. G. Wells in two sets of twins, all four dying of the same histological type of tumour. It is also not uncommon to find a strong family history of cancer in some patients, and the idea of the hereditary

character of cancer should not be altogether dismissed without the reservation that there is some evidence of an hereditary factor in cancer susceptibility. The inheritance of this susceptibility alone is probably not always sufficient to ensure the occurrence of malignant tumours; an external factor acting on a susceptible soil is probably the cause of neoplastic conditions. An investigation by A. Hunter of two groups of life insurance policy holders afforded no evidence of the inheritability of cancer.

Hormones and Malignant Disease.—Numerous studies in recent years have suggested a relationship between the activity of organs of internal secretion and the growth of tumours. K. Suguira and S. R. Benedict⁹ investigated the effect of insulin, thyroxin, parathormone, epinephrin, theelin, etc., on rat carcinoma, rat sarcoma, mouse cancer, and chicken tumours. Repeated injections of these substances had no retarding effect upon growth of transplanted tumours. Aqueous extracts of the whole pituitary had a slight stimulating effect on the growth of mouse melanoma and rat sarcoma. O. O. Meyer and C. McTiernan¹⁰ studied the effect of various hormones on the metabolism of certain tumours by the Warburg method; thyroxin was found to inhibit oxygen consumption of tumours, but stimulated the metabolism of isolated liver tissue. F. Ludwig and J. von Ries¹¹ tested the influence of known hormones on the growth of seeds and on carcinoma of white mice. Mice previously inoculated with carcinoma were injected with adrenalin, and the rate of growth of the tumour was definitely slowed. With prolactin, mouse carcinoma entirely disappeared and the animals remained alive.

2. RADIUM THERAPY.

In addition to skin neoplasms, three varieties of cancer—uterus, breast, and tongue—are now widely treated by radium in most hospitals, and the methods adopted are similar in all institutions. Radium treatment of cancer of the pharynx and larynx still remains in the hands of very few, patients with lesions in these sites being more often treated by X-radiation, whilst tumours of the brain, bone neoplasms, rectal cancer, and pulmonary growths remain in the experimental stage. In the Medical Research Council's Report² for the year 1933 it is stated that "there is very little apparent difference in the modes of technique adopted (in the treatment of cancer of the uterus) in this country and, indeed, in the world at large, though there is a considerable difference in the degree of success obtained." The report is significant in so far as for the first time an official statement is made as to the established value of radium.

Carcinoma of the Cervix.—The report referred to above states: There are two outstanding points, namely: frankly operable cases are treated just as successfully by radium as by surgery, but with a much smaller operation mortality, while surgically inoperable cases treated by radiation yield a by no means negligible percentage of clinical cures of five years' standing. To assess the results it is useful to remind the reader of the universally accepted classification or grading of cases of uterine cancer according to the extent of the disease. The radiological sub-committee of the League of Nations' Health Organization grades these cases as follows:—

- Stage 1.—Neoplasms strictly limited to the cervix.
- Stage 2.—Neoplasms spreading into one or more fornices.
- Stage 3.—Infiltration of parametrium.
- Stage 4.—Massive carcinoma involving both parametria.

For practical purposes histological grading is of less importance than anatomical grading. The collected results of ten centres reporting to the Medical Research

Council² are as follows: of a total of 2001 cases of carcinoma of the cervix treated in the years 1921-32 there were alive at the end of the time 650 patients (*Table III*).

Table III.—MEDICAL RESEARCH COUNCIL REPORT. CARCINOMA OF CERVIX: 2001 CASES (1921-32).

STAGE OF DISEASE				LIVING	DEAD
Stage 1	..	..	..	165	95
Stage 2	..	..	..	190	278
Stage 3	..	..	..	261	713
Stage 4	..	..	..	34	265

The results obtained by the centres reporting to the National Radium Commission³ are as follows for a collective period of three years (*Table IV*).

Table IV.—NATIONAL RADIUM COMMISSION REPORT. CARCINOMA OF THE CERVIX (THREE YEARS).

STAGE OF DISEASE				TOTAL CASES		PERCENTAGE NET SURVIVAL RATE AT THE END OF		
				Number	Percentage	1st year	2nd year	3rd year
Stage 1	..	..		123	20.9	85.8	74.4	60.8
Stage 2	..	..		148	25.1	76.8	57.0	48.1
Stage 3	..	..		241	40.8	61.6	43.9	32.6
Stage 4	..	..		78	13.2	31.2	16.9	11.8
All stages	..	..		590	100.0	66.3	49.8	39.4

It should be noted that the three years' survival rate in Stage 1 is five times greater than in Stage 4. The importance of early treatment need hardly be pointed out.

Carcinoma of the Breast.—For a useful critical analysis of the results of radium treatment it is not sufficient to subdivide the cases into operable and inoperable, as the treatment embraces a much wider group than does excisional surgery. A classification as to the stage of the disease is as important as in the uterine group. The following classification is widely made use of:—

Stage 1.—The carcinoma is limited to the breast as shown by clinical examination.

Stage 2.—The carcinoma has invaded the axillary glands as shown on clinical examination.

Stage 3.—The carcinoma is widespread. There is attachment to the pectoralis major muscle or ulceration of the skin; lymph nodes in other situations than the axilla; involvement of both breasts.

Of 557 cases reported by the National Radium Commission³ for a period of three years the results in each stage are shown in *Table V*.

The three years' survival rates are in direct proportion to the stage of the disease. The results obtained depend chiefly on the stage of the disease when first treated. In advanced cases with wide involvement of the skin and massive lymphatic enlargement no form of treatment is likely to give satisfactory

Table V.—NATIONAL RADIUM COMMISSION REPORT. CARCINOMA OF THE BREAST (THREE YEARS).

STAGE OF DISEASE	TOTAL CASES		PERCENTAGE NET SURVIVAL RATE AT THE END OF		
	Number	Percentage	1st year	2nd year	3rd year
Stage 1	116	20.8	90.3	78.8	64.0
Stage 2	171	30.7	74.9	54.0	39.9
Stage 3	270	48.5	59.6	34.6	24.9
All stages	557	100.0	71.6	50.0	37.7

results. Palliation, however, is given by radium, with temporary retrogression of the disease and prolongation of life. Occasionally very advanced cases are arrested and survive up to five years. Stanford Cade's¹² series of 200 cases of breast cancer from 1926 to 1932 shows a survival rate as follows (*Table VI*):—

Table VI.—WESTMINSTER HOSPITAL REPORTS.

DATE	TOTAL	OPERABLE	INOPERABLE	ALIVE	DEAD	UNTRACED
1926-7 ..	6	0	6	1	4	1
1928 ..	11	3	8	6	5	0
1929 ..	43	10	33	12	28	3
1930 ..	48	13	35	22	23	3
1931 ..	49	18	31	26	19	4
1932 ..	43	18	25	38	5	—
Total ..	200	62	138	105	84	11

There can be no doubt that the prognosis in cancer of the breast can be materially improved by the judicious, careful, and expert use of radium, either as the sole method of treatment or in combination with surgery. Early diagnosis remains the greatest single factor influencing the terminal results. The development of visceral or skeletal metastases depends chiefly on the stage of the disease when treatment is undertaken, but there is some indication that radiation if adequate adds a little to the length of period of freedom from disease.

Carcinoma of the Tongue.—The classification of cancer of the tongue, as adopted by the National Radium Commission³, follows that selected for breast cases and is essential for the true value of radium treatment to be appreciated. The disease is subdivided into four stages according to the anatomical extent of the lesion :—

- Stage 1.—The carcinoma is limited to the tongue and there is no lymphatic involvement.
- Stage 2.—The carcinoma involves the tongue and floor of the mouth, but there is no lymphatic involvement.
- Stage 3.—Clinical evidence of secondary deposits in the cervical lymphatics.
- Stage 4.—Involvement of bone.

Most, if not all, surgeons admit that the primary lesion in the tongue can be adequately treated by radium; according to the report of the Medical Research Council,² "the position is, indeed, such that at most responsible

centres there is felt to be comparatively little difficulty in dealing with primary growths of the tongue by radium treatment, this treatment being either interstitial or by means of larger units, one gramme of radium and upwards, applied externally. Where dissatisfaction remains, however, is in the treatment of the glands associated with buccal cancer, and at present there seems to be about an even balance of opinion and practice between surgical removal and irradiation either interstitially or externally by radium or X rays." It may be of interest, therefore, to review the opinions of authorities in Europe and the United States as expressed at the fourth International Congress of Radiology at Zurich¹ in 1934. The following opinions are worthy of record: J. Maisin¹ (Belgium) is disappointed with the results both of surgery and radiation. He advocates external irradiation of the cervical lymphatic glands with surgical excision in strictly operable cases. J. Shneider and A. Gunset¹ (Strasbourg) have abandoned radium collars in favour of a bomb which so far contains 900 mgrm. of radium, with surgical removal whenever possible. Santoro D'Emidio¹ (Rome) prefers radium to surgical excision. He employs external radiation by means of plaques applied for periods up to twenty-five days. J. Murdoch¹ (Brussels) combines dissection of the cervical glands with simultaneous insertion of radium needles contained in rubber tubes and left in position five days. He states that the results since 1929 have been on the whole satisfactory. M. Friedman¹ (New York) studied the comparative merits of X rays, a 5-grm. bomb, and bilateral plaques of 100 mgrm. of radium. He finds that there is very little difference in the eventual effects between the three methods external radiation is given preference to surgery. Burton Simpson¹ (Buffalo) believes that in the majority of cases of cervical metastases external radiation either by the 4-grm. radium bomb or by X rays is the method of choice. Regaud¹³ (Paris) is strongly in favour of block dissection in all operable cases, using external radiation by plaques or the bomb in inoperable cases only. The consensus of opinion is that radiation to be efficacious in the treatment of cervical metastases must be given by either prolonged X-ray treatment by Coutard's method or some modification of it, or by means of a bomb.

The three-year results and net survival rate in cancer of the tongue treated by radium determined by the National Radium Commission² so far is as shown in *Table VII*.

Table VII.—NATIONAL RADIUM COMMISSION REPORTS. CANCER OF THE TONGUE (THREE YEARS).

STAGE OF DISEASE	TOTAL CASES		PERCENTAGE NET SURVIVAL RATE AT THE END OF		
	Number	Percentage	1st year	2nd year	3rd year
Stage 1	84	26.1	67.1	49.4	40.0
Stage 2	31	9.6	53.3	27.6	21.4
Stage 3	170	52.8	38.3	18.3	12.9
Stage 4	37	11.5	44.4	13.9	2.9
All stages	322	100.0	47.9	26.8	19.6

Carcinoma of the Maxilla.—In a contribution to the 1932 statistical report of the Mount Vernon Hospital, Douglas Harmer and Stanford Cade¹⁴ point out that for malignant growths of the upper jaw there are three main lines of treatment—surgery, diathermy, and irradiation. They maintain that

all three methods should be at the patient's disposal, because as the result of long experience of these growths, it is evident that neither surgery nor diathermy alone is satisfactory owing to the tendency of local recurrence. The method of treatment advocated, consists of: (1) Preliminary high voltage X-ray; (2) Fenestration of the palate, providing good drainage, free exposure of the tumour, and a possibility of inspecting the site of the lesion subsequently; (3) Irradiation by means of small doses of radium applied for prolonged periods of time by means of dental applicators accurately fitting the cavity.

Mass Radiation (the Radium Bomb).—In August, 1932, the King Edward's Hospital Fund placed at the disposal of three London hospitals 3 grm. of radium to be used in units of 1 grm. Under the auspices of the Medical Research Council, and the Department of Scientific and Industrial Research, an investigation into the use of large quantities of radium was started under the name of "Radium Beam Therapy Research". In the conduct of the research the procedure adopted was based on that followed by the Stockholm School. The apparatus used is a replica of the Stockholm bomb. The amount of radium used is at present 5 grm. At Westminster Hospital H. T. Flint, L. G. Grinnett, E. Rock Carling, and Stanford Cade¹⁵ report on the latest modification of the Westminster mass radiation apparatus (*Plates XIV, XV*). The 'bomb' is reduced to quite small dimensions and weighs only 38 lb. It contains 2 grm. of radium. It is easy to handle and is safe both for the patient and the attendant. The type of case submitted to this form of radiation includes growths in the posterior part of the tongue, pharyngeal and extrinsic laryngeal lesions, and selected cases of bone sarcoma, lymphosarcoma, and carcinoma of the breast. The use of large quantities of radium is considered essential in such cases.

3. AIDS TO DIAGNOSIS.

The periodical publication of tests of malignant disease by serological, chemical, electrical, and various other methods receives a good deal of publicity, mostly in the lay press. Critical investigations of these tests have hitherto been universally disappointing, and led to the inevitable abandonment of their use.

In previous numbers of the MEDICAL ANNUAL reference was made to Bendien's test¹⁶, which by now has joined all other tests in fully deserved oblivion. An aftermath of Bendien's test still remains in the Cronin-Lowe serum reaction for malignancy.¹⁷ The original publication revived the profession's interest, and the test has been repeated by many biochemists and pathologists. Confirmation of the original results claimed are so far lacking. J. Patterson and J. Adler¹⁸ studied this diagnostic test, and in their hands the reaction gives a correct result in only 60 per cent of cases. [It may be pointed out that this percentage is only a 10 per cent improvement on results obtained by such a test as tossing a coin.—S. C.] Their conclusion is, therefore, that the method has no diagnostic value.

W. Moppett¹⁹ describes a serological test for cancer based on the study of antibodies. He points out that Lumsden has established the existence of antibodies in the case of inoculated tumours in laboratory animals. He assumes the presence of such factors in the blood of the cancer patient. The method consists in the observation of migratory movements of tumour cells *in vitro* and may be termed purely biological. Negative results are of no value, but a strong positive result is of definite practical value. This biological test needs confirmation and further investigation.

An intracutaneous carcinoma reaction described by Freund and Kammer²⁰ was tested by two workers at the clinic of the Cologne University. A positive

PLATE XIV

RADIUM TELETHERAPY

(H. T. FLINT, L. G. GRIMMETT, E. ROCK CARLING, AND STANFORD CADE)

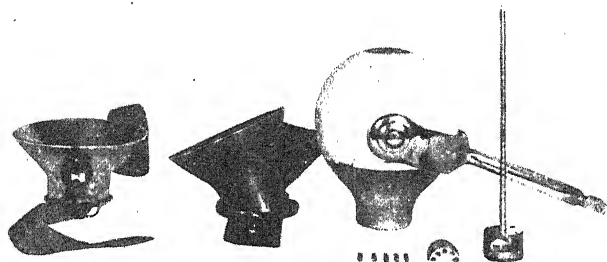


Fig. A.—Details of latest apparatus.

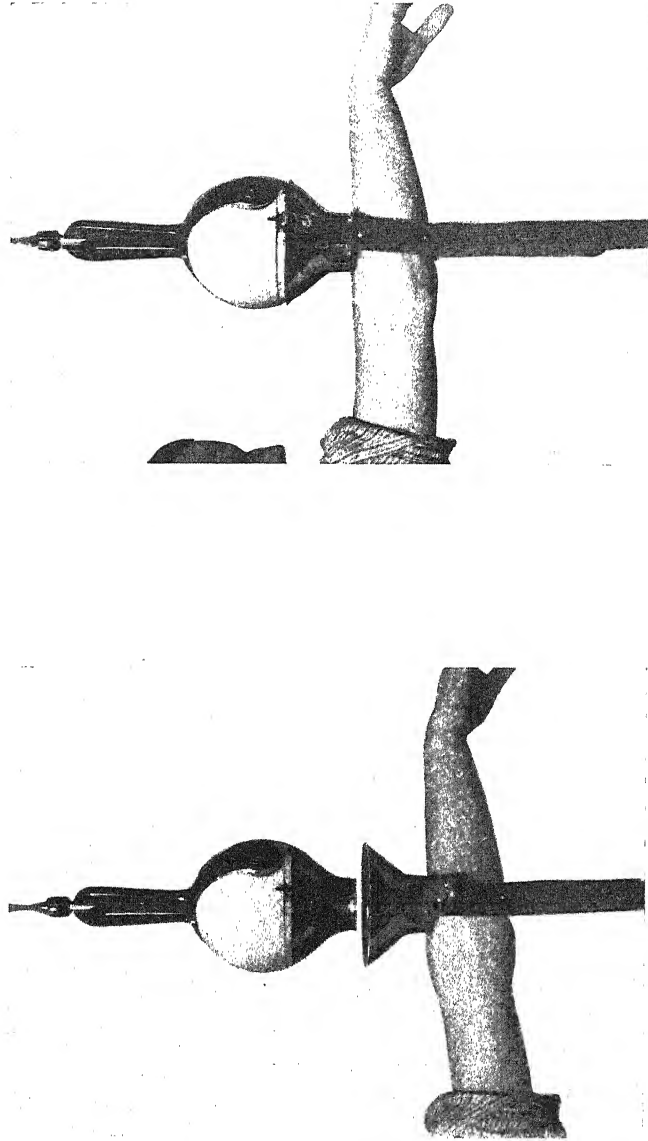


Fig. B.—The apparatus in use. The head is here held away to facilitate the observer's view, but in practice would be comfortably supported in a natural pose.

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PLATE XV—RADIUM TELETHERAPY—continued

(H. T. FLINT, L. G. GRIMMETT, E. ROCK CARLING, AND STANFORD CADE)



To make clear the method of selecting site and direction for treatment with subsequent rapid fixation of the radium container.

reaction is manifested by a nodule the size of a cherry surrounded by a zone of erythema lasting eight days. A negative reaction appears earlier, the size of the nodule is smaller, and it disappears in five days. The authors place great reliance on the test, admitting that wide experience is necessary.

M. Aron²¹ describes a new specific principle in the urine of cancer patients. The filtrate of a precipitate obtained by the addition of 95 per cent alcohol to urine is injected into rabbits, and the suprarenal glands of the rabbit are examined histologically three or four days after injection. A positive cancer reaction is indicated by changes occurring in the zona fasciculata of the suprarenal cortex. The work is original, interesting, and lends itself both to accurate repetition and further study. The reaction is said to be specific to cancer and can be prevented by an injection of blood from another rabbit previously injected with urine extract from a cancer patient.

I. Kaplan²² reports a differential diagnosis test for tumours of the testicle. R. B. Henline discusses the rôle of prolane A in teratoma testis. Zondek discovered in 1929 that sex hormone is excreted in the urine in the cases where such tumours are present, and this has proved a valuable test. A malignant tumour of the testis is indicated by the presence of this sex hormone in the urine, and through a quantitative estimation of the prolane A excreted not only the presence of a tumour but its type may be determined. Recurrence and metastases will cause increase in the excretion of prolane A even before their clinical manifestations are apparent.

4. CHEMOTHERAPY.

Selenide Treatment.—The only important contribution on the chemotherapy of malignant disease since the last issue of the MEDICAL ANNUAL is that by A. T. Todd.²³ His previous work on a modification of lead therapy is well known. The new treatment was first published in April, 1934, but quite a number of experienced surgeons and radiologists had the opportunity of seeing the cases under treatment prior to publication. Todd's theoretical conceptions of cancer are not necessarily shared by others, but his results are impressive and deserve the fullest investigation by all who are called upon to take care of the advanced cancer patient. Patients are only accepted for treatment by Todd after they have been given up by surgeon, radiologist, and radium officer. In spite of this, 38 per cent of cases which received adequate treatment by Todd's methods resulted in apparent cures.

Todd first experimented on inoperable and advanced cancer cases with a combination of lead and selenium, and a colloidal selenide D4S has been used for five years. He considers the results good, 10 per cent being claimed as four-year cures, while 50 per cent showed marked prolongation of life. Certain cases failed to benefit, and the action of concurrent radiation from X rays and radium was tried. The doses were half the usual doses given if the case were treated exclusively by radiation. It was found that rapid intensification of the growth of the neoplasm followed. The same results followed in treatment of mice by similar methods. Todd suggested that the presence of the selenide had converted a relatively small into a relatively large dose of radiation, which had a stimulating effect on the neoplasm. Another selenium colloid was therefore tried, in the hope that it would be more amenable to combined colloid-radiation therapy. A double colloid of sulphur and selenium was prepared, called SSc. Todd considers that carcinoma is an infective disease, and that a defence mechanism of mesoblastic tissue, which he calls 'junction tissue', is present, but that the defence always fails. A system of treatment which will increase this defence should be attempted. If stimulation of the defence became adequate, the growth of neoplasm would be inhibited. He

considers the macrophage cells of the junction tissue to be the key cells, as they govern the functions of the others, and he maintains they can only be influenced by colloids. His newer method of treatment is radiation plus intravenous injection of selenium colloids. He produces many proofs that radiation can act upon and alter the selenium colloids—the clinical proof is the success or otherwise of the treatment. After an intravenous injection of SSe a focal reaction sets in. Two days later a dose of deep X rays is applied. If the dose is adequate, focal reaction appears again. Later it appeared desirable to determine whether a radio-active colloid might be effective; a newer radio-active selenium, called R.A.S., was therefore tried. The treatment is prolonged, even extending over years. Toilet operation precedes treatment.

Intravenous injection of SSe is followed two days later by $1\frac{1}{2}$ Holzknecht units of deep X rays. These doses are repeated weekly until 12 H units have been given. Doses aim at obtaining a mild exacerbation of symptoms. Then a three weeks' course of R.A.S. follows. If marked reaction follows, the dose is lessened. After three weeks SSe and R.A.S. alternate. This is to produce a slow progressive ionization from radiation of R.A.S. If the growth progresses, the patient is again started on ionization from X rays, but if possible this should not be done within three months from the termination of the last course. If progress is good, alternation is continued for at least six months; then eight to ten weeks without treatment; followed by alternation if progress is satisfactory, or, if unsatisfactory, by ionization followed by alternation.

Series 1 (May, 1931, to September, 1932).—93 cases, unselected. 5 cases are still under treatment; 18 dropped out; 23 had inadequate treatment; 47 had adequate treatment; 29 cases died; 15 are apparent cures. Thus of the whole series 20 per cent are apparent cures.

Series 2 (since September, 1932).—62 cases. Only 28 have had adequate treatment. Of these, 12 are dead, 4 doing badly, 9 doing well; 3 are discharged, apparently cured.

Todd concludes his original communication with the following remarks: "This is the new method, described as fully as possible. The work is done in public, and has been inspected by a number of distinguished surgeons. The method has produced these results. If the same results are not obtained at other clinics, then let those clinics look to their technique and their ability to drive a difficult treatment through to results as good as, or, I hope, better than these." In spite of these words of warning, no clinic has yet come forward with evidence that results can be obtained by others than the originator of the method.

REFERENCES.—¹*Rep. Internat. Radiologenkongress* (Zürich), 1934; ²*Med. Research Council, Medical Uses of Radium*, 1933 (pub. 1934); ³*Radium Treatment in Cancer of Certain Sites* (Rep. Nat. Rad. Com.), 1934; ⁴*Brit. Emp. Cancer Campaign*, 11th Annual Report, 1934; ⁵*Spectator*, 1934, June 7; ⁶*Lancet*, 1934, i, Jan. 6; ⁷*Bristol Med.-Chir. Jour.* 1933, Winter; ⁸*Amer. Jour. Cancer*, 1933, xviii, July, 535; ⁹*Ibid.* 583; ¹⁰*Ibid.* 1934, xx, Jan., 96; ¹¹*Schweiz. med. Woch.* 1934, lxiv, Feb. 17, 14; ¹²*Westminster Hosp. Rep.* 1934, xxii; ¹³*Amer. Jour. Roentgenol.* 1929, xxi, Jan., 5; ¹⁴*Mount Vernon Hosp. Statistical Rep.* 1930–1, 2; ¹⁵*Brit. Med. Jour.* 1934, i, April 14, 653; ¹⁶*Spez. Verander des Blutserums* 1931, Jena; ¹⁷*Brit. Med. Jour.* 1933, i, 407, 536; ¹⁸*Ibid.* 1933, ii, Dec. 9, 1063; ¹⁹*Med. Jour. of Australia* 1934, xxi, May 26, 681; ²⁰*Wien. med. Woch.* 1934, lxxxiv, March 3, 26; ²¹*Presse méd.* 1934, xlii, May 23, 833; ²²*Year Book of Radiology*, 1934; ²³*Brit. Jour. Surg.* 1934, xxi, April, 619.

CARDIOVASCULAR DISEASE, CONGENITAL.

A. G. Gibson, M.D., F.R.C.P.

H. B. Sprague, C. H. Ernlund, and F. Albright¹ refer to a rare congenital abnormality, the result of an unusual development of the arterial system, which produces œsophageal obstruction. The abnormality consists in the persistence of the fourth right primitive arch of the arterial system, which

takes a course to the right and then behind the œsophagus to the thoracic aorta in its normal position in the lower part of the chest. In these cases the main aortic arch may be undeveloped or absent. Over 100 cases have now been reported, and these authors add two more. In a review of the literature they note that death has occasionally resulted from obstruction of the œsophagus and trachea. The larynx also may be paralysed from pressure on the right inferior laryngeal nerve which passes round the right aortic arch. The pulmonary affections are cyanosis, wheezing respiration, and cough. When the pressure on any of the important organs is marked, death may occur in childhood. Other symptoms described have been a sensation of weight and pressure across the chest with pain down the arms and dysphagia. It occasionally occurs, however, without any symptoms whatever, and one man is reported to have died at 78 and a woman at 87. The diagnostic points are that the position of the maximum intensity of the aortic second sound is at the right sterno-clavicular joint instead of in the second interspace. By X rays a circumscribed shadow with strong pulsation may be found to the right of the sternum beginning at the fourth costal space and with a very small or no aortic knob on the left side. Good X-ray pictures are shown of the chest and of the interruption in the barium swallow by the constriction of the œsophagus. The dysphagia would appear to become evident between the ages of 15 and 30, and females appear to be more affected than males.

REFERENCE.—¹*New Eng. Jour. Med.* 1933, Oct. 5, 679.

CARDIOVASCULAR SYPHILIS. (See SYPHILIS, CARDIOVASCULAR.)

CAVERNOUS SINUS THROMBOSIS. *F. W. Watkyn-Thomas, F.R.C.S.*

E. Jefferson Browder¹ reports a case of cavernous sinus thrombosis by operation. Five days before admission the patient noticed "a small pimple" on the right side of the nose, which spread into the malar region. On the fifth day the swelling was treated by X-ray therapy. The eyelid swelled after radiation, and on the seventh day there was severe headache and proptosis of the right eye. The movements of the eye were limited and there was swelling of the disc. The left eye was unaffected. A growth of staphylococcus (the type is not described in the paper) was obtained from the carbuncle and from blood cultures. Lumbar puncture showed a cell content of 20 per c.mm., and a trace of globulin. It was decided to occlude the cavernous sinus by electro-coagulation. A large decompression was done on the right side and the temporal lobe was elevated. The cavernous sinus was exposed and was obliterated up to the sphenoidal fissure by diathermic electro-coagulation. The cranial wound was then closed without drainage. Next, the angular vein was exposed and opened, and pus was found tracking into the orbit. The convalescence was stormy; there was severe proptosis for five days, and three localized collections of pus formed in the orbit and had to be drained. Eventually the patient recovered, with complete blindness of the right eye. The left eye was unaffected throughout.

This case is of great importance. In view of the rarity of recovery the method seems well worth trial in future. The operation is not so severe or so dangerous as the other methods of attack on the cavernous sinus which have been attempted.

REFERENCE.—¹*Laryngoscope*, 1933, xliii, 829.

CEREBRAL ABSCESS. (See BRAIN, ABSCESS OF.)

CEREBRAL ANEURYSM. (See INTRACRANIAL ANEURYSM.)

CEREBRAL PNEUMOGRAPHY AND ANGIOGRAPHY. (*See also*
X-RAY DIAGNOSIS.) *Geoffrey Jefferson, M.S., F.R.C.S.*

The replacement of cerebrospinal fluid by air is now some sixteen years old, for it was introduced by Dandy in 1918. The method to which Dandy himself gave preference was, of course, ventricular replacement by direct puncture of one or, better, of both ventricles, after making suitably placed burr-holes in the skull. This method is essentially a surgeon's procedure, and although physicians have used the method with success, it still remains definitely a surgical operation. The passage of time has emphasized this fact, for we have learned that alarming symptoms may arise within a few hours of the intervention, necessitating an urgent operation which will usually take the form of an unpremeditatedly early attack on the tumour itself. For it is the tumour cases which are most apt to go wrong after air replacement. In order to reduce the surgical steps to a minimum, recourse has been had increasingly of late years to encephalography, i.e., to air injection by the lumbar route. Further to reduce the risks of this procedure the amount of air injected as a routine has decreased. The original method consisted in the removal, little by little, of cerebrospinal fluid and the injection of a slightly smaller quantity of air *pari passu* with the withdrawal of fluid. There was no set quantity of fluid to be withdrawn or of air to be injected, except that the latter should be about nine-tenths of the former, to allow of the expansion of the warmed air within the skull. Amounts of 75 c.c., 100 c.c., 150 c.c., and even more have been withdrawn and the appropriate quantities of air injected on numerous occasions with relatively slight disturbance to the patient. Subsequent X-rays give with such large quantities of air beautiful pictures of the cerebral contours and of the ventricular outlines, and have proved of the greatest value not only in the diagnosis of individual cases but in increasing our knowledge generally of intracranial physiology. When the diagnostic point at issue is the plain question of the localization of a tumour it has often been felt that the amount of air which has gone up over the surface of the brain has been wasted, for the only points on which definite information has been required were the position of the ventricles, whether displaced to one side or the other, and whether filling defects were present owing to the obliteration of a ventricular horn by tumour. The amount of air necessary to fill the ventricles should not have been very great, provided that all of it went into these cavities and was not wasted by spreading itself over the cerebellum and hemispheres. It has been discovered that there is a very strong tendency for the air to pass primarily into the ventricles. Advantage has been taken of this fact by L. Laruelle,¹ who was the first to inject extremely small quantities of air, generally 5 c.c., which do not necessitate any withdrawal of fluid whatever. It is a special point in this method that no fluid should be withdrawn until after the air has been injected. To this method he has given the name 'repérage'.

Repérage.—This is an unsatisfactory title as it is difficult to translate, but it means the measurement of the ventricles, in this case ocularly, by air. Laruelle makes his injections in the X-ray room with the patient sitting in front of a vertical cassette. The patient must sit bolt upright with the head slightly flexed; a lumbar puncture is done and from 2 to 8 c.c. of air are injected. The largest quantity ever used is 10 c.c., but this only after a smaller quantity has failed on a previous occasion. Surprisingly complete views of the ventricles can be obtained with these small quantities of air. Monrad Crohn has done the same sort of thing by injecting two lots of 5 c.c. air, introduced rather quickly after the withdrawal of 6 c.c. of cerebrospinal fluid before each half of the air injection. This is not quite the same thing as Laruelle's repérage, the essence of which is that air is injected before any alteration in anatomical relationship

is artificially produced by cerebrospinal fluid withdrawal. It is thought that the air is then most likely to pass up into the ventricles. On the other hand, small quantities of air injected as by M. Crohn can be very helpful, and if no picture is obtained with 10 c.c. of air, the operator can go on with his replacement step by step until a satisfactory picture of ventricular contours is obtained. This would amount to a fractional encephalography.

Fractional Encephalography.—This is undoubtedly the best means of performing a lumbar air replacement, but one would always begin with a frank repérage. The only difficulty about fractional encephalography is that it must be done in an X-ray department, and as it takes some time, and as a number of cases often have to be done, it is not always a very easy arrangement. In the writer's opinion, however, it is unwise ever to undertake more than one encephalogram in one day, particularly if large quantities of air are to be used, for one never knows whether one may not have to operate later in the day. With repérage this objection does not hold, for the patients are often unaware that anything more than a lumbar puncture has been done.

Pneumography in Head Injuries.—The whole problem of ventriculography and encephalography is well reviewed by Dahl-Iversen, of Copenhagen.² Their chief value is, of course, in tumour cases and in tumour suspects. They are however, being used increasingly in head injuries even in the acute cases. A. Lippens and L. Dejardin,³ of Brussels, have used encephalography chiefly in the diagnosis of old head injuries presenting sequelæ some time afterwards, but there is definitely a tendency developing to use it in acute head injuries, particularly in those suspected of subdural hæmatoma. It is interesting that it can be used in these cases without adding appreciatively to the mortality and can at times be of very great value. (*See also HEAD INJURIES.*)

Ventriculography.—C. Pileher and H. M. Wilson⁴ have made a close analysis of the pneumoventriculograms from 97 cases of verified intracranial lesions. Dandy has always maintained that by this means an infallibly correct diagnosis is possible in every case, but Pileher and Wilson, utilizing the material from Dr. Ernest Sachs' Clinic at St. Louis, agree with the English opinion that ventriculograms are not always as completely informative as the observer could wish. Their paper is important, because they give a catalogue of all the cases, with situation and nature of the lesion and the conditions of the lateral and third ventricles. With frontal tumours they found that of 26 cases, 22 results were positive, 3 undeterminable, and 1 misleading. Of 26 posterior fossa tumours, 4 were listed as misleading through failure to visualize the third ventricle. This last is, of course, an exceedingly important point, because the discovery of symmetrical dilatation of the lateral ventricles does not certainly indicate a lesion in the posterior fossa. Not only might there be a stricture of the iter of Sylvius (admittedly a very rare condition), but also a tumour in the third ventricle itself, or a tumour of the pineal body. There is a general impression that pineal tumours are easily seen in ventriculograms, indicating their presence by a recognizable indentation of the dilated ventricles, but this was not true in all of the four cases specifically mentioned in this paper, for in one the result is definitely stated to be misleading and the others indeterminate. Of the whole 97 ventriculograms, 18 failed to indicate the approximate location of the lesion. It is very interesting to note that there were 5 cases with verified lesions in which normal pictures were obtained—in 3 of these the lesions were in the surface of the cortex, and in 2 others were quite small.

A. Torkildsen and W. Penfield⁵, reviewing a large number of films after air injection, and comparing the pictures with models of the ventricular system, point out the exact portions of that system represented in the pictures. These

will be found of service to those wishing for more precise knowledge of ventricular anatomy as visualized by pneumography.

Arterial Encephalography or Angiography.—This method we owe to Egaz Moniz,⁶ of Lisbon, who has shown that it is possible to get good pictures of the cerebral arteries by injecting an opaque substance at open operation (Fig. 10). The carotid artery of whichever side it is necessary to explore is first dissected out; the patient is then transferred to the X-ray department and everything is made ready for the taking of a flash photograph of the head in a lateral position. The opposite side will always have to be downwards, nearest the plate, but this does not matter. A 20-c.c. Record syringe is now filled with 'thorotrast' and an ordinary narrow exploring needle attached. The carotid artery is then punctured and the solution injected as quickly as possible. After 10 to 12 c.c. have been introduced a photograph is taken, and, if possible, another one before all the solution has been used up. Moniz has

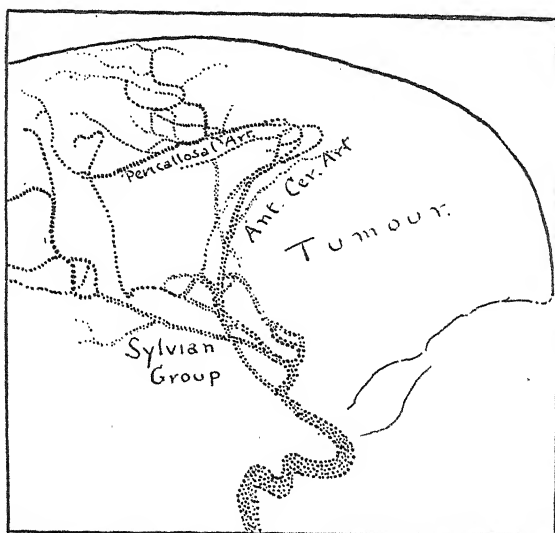


Fig. 10.—Cerebral angiogram of a frontal tumour.
(Re-drawn from 'The Lancet'.)

actually arranged a special turn-table allowing of the exposure of four films rapidly, one after the other. In practice only two films are required, and maybe only one. Great speed is necessary in changing the films, for the needle should not be left long in the artery for fear of clot formation and subsequent embolism. On the withdrawal of the needle the carotid usually bleeds for two or three minutes, but the hæmorrhage is easily checked by swab compression. It would be unwise to inject a brittle or sclerotic artery, for the needle might cause a cut in the wall instead of a puncture; but so far no such happening has been published.

The interpretation of the pictures depends first on some experience of the normal arrangements of the visualized cerebral tree of the internal carotid, the middle and anterior cerebrals, and their branches. Some tumours very materially alter the appearance by displacement of branches, making it clear that a tumour is present in such and such an area. Very occasionally a richly

vascularized tumour may become evident as a dark shadow—a tumour for instance such as an angiomatous meningioma. In the reviewer's opinion the results arrived at are by no means so certain as those obtained by ventricular pneumography, and the method will find its greatest field of usefulness when a vascular lesion is suspected such as a racemose angioma of the cortex, or an aneurysm. It has this to its advantage in tumour cases, that it is free from all risk of untoward sequelæ, but it can hardly be expected to give useful information unless it is used frequently enough to render the clinician familiar with vascular patterns. Moniz has made an analysis of 300 angiograms without a fatality.

REFERENCES.—¹*Rev. neurol.* 1933, i, 129; ²*Lyon. chir.* 1933, Nov., 670; ³*Presse méd.* 1934, March, 455; ⁴*Surg. Gynecol. and Obst.* 1934, lviii, 995; ⁵*Arch. of Neurol. and Psychiat.* 1933, xxx, 1011; ⁶*Lancet*, 1933, Nov., 1144.

CEREBRAL TUMOURS. (See INTRACRANIAL TUMOURS.)

CEREBROSPINAL FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—A recent survey¹ of the incidence and mortality of cerebrospinal fever throughout the world in 1932–3 shows that the most important outbreak in Africa was that which occurred in Lower Egypt. It began in November, 1931, reached its climax with about 1000 cases and 500 deaths per fortnight at the beginning of March, 1932, and then rapidly declined. A recrudescence took place in November and lasted till March, 1933, after which there was a regression. Epidemics also occurred in the Anglo-Egyptian Soudan in 1932 and 1933, the outbreak of 1933 being of much shorter duration than that of 1932. In the United States the incidence of cerebrospinal fever fell from 5534 in 1931 to approximately 3000 in 1932 and 1933. In Asia the pandemic which arose in the Far Eastern ports, especially those of China in 1932, showed a fresh increase in 1933. In British India cerebrospinal fever is comparatively rare except in Calcutta, where there were over a hundred deaths in 1932 and 1933. In Turkey a campaign of antimeningococcus vaccination in November, 1932, was followed by a considerable decline in the incidence of the disease in 1933, only about 4 cases having been notified among 74,500 vaccinations. In Europe the highest death-rate was found in Great Britain, although the disease was stationary in 1932 and even showed a slight decline in 1933. Apart from Germany, where the death-rate rose from 0.8 to 0.9 per 100,000, the disease was everywhere on the decrease in 1932 and 1933.

According to E. L. Sturdee and W. M. Scott,² during 1932 2095 cases of cerebrospinal fever were notified and 1190 died in the West Riding of Yorkshire. Of 893 cases in which the type of meningococcus was examined, 726 belonged to Group I and 167 to Group II. There is therefore no evidence for the view that the epidemic was caused by Group I, while Group II was responsible for sporadic or endemic cases. In 859 cases in which the diagnosis was confirmed by bacteriological examination the mortality was 38 per cent. This series, however, included several patients who had had only a small dose of serum and those who had not been treated until several days after the onset of the disease. In 421 cases in which the serum was properly applied the mortality was 28.9 per cent, and in 153 in which the serum was given in the first three days the mortality was 24.8 per cent.

Dragomir³ states that the incidence of cerebrospinal fever in the Yugoslav army is insignificant, being only 0.18 per cent, whereas the case fatality is disproportionately high (70.83 per cent). He attributes this high rate to late diagnosis, the frequent impossibility of differentiating the type of

meningococcus and of employment of monovalent antimeningococcus serum, and the small quantities of serum used. Although the incidence of cerebrospinal fever is much lower in the Yugoslav army than in the French, Czechoslovak, and Lithuanian armies, the fatality rate is much higher than in any of them. The disease is merely sporadic in character in the Yugoslav army, in which it is chiefly the recruits who are attacked, especially in the spring. Dragomir does not consider that the investigation and isolation of carriers should play an important part in the prophylaxis, but attaches more importance to the avoidance of overcrowding, improvement of diet, and provision of sufficient rest.

Y. Jimura⁴ states that during the last three years there has been a total of 1021 cases of cerebrospinal fever in Japan, or 0.59 per 100,000 inhabitants. Most of the cases were notified in the west of the country, where the temperature was warmer than elsewhere; 1.66 per 100,000 inhabitants occurred in the urban districts, 0.58 in the small towns, and 0.29 in the villages. Most of the cases were in children and young persons; 33.4 per cent of the deaths took place in the first week and 58.8 per cent in the second week of the disease. In most cases recovery occurred in the fourth week. The fatality rate was 79.9 per cent in cases treated at home, and from 48.8 to 67.3 in cases treated in hospital.

SYMPTOMS AND COMPLICATIONS.—The *youngest case on record* of meningococcus meningitis is reported by A. Brown and N. Silverthorn⁵ in a female infant, aged 22 days. The symptoms were fever, vomiting, irritability, anorexia, Kernig's sign, and later nuchal rigidity. The cerebrospinal fluid was turbid and showed meningococci. Antimeningococcal serum was given intravenously on the first and third day of disease and by the intrathecal route daily. The spinal fluid became sterile nine days after the onset, and the child was discharged from hospital in fifteen days.

C. Ameur,⁶ who records six cases including one of his own in patients aged from 6 to 16 years, states that *purpura fulminans* is very frequently if not always due to meningococcal infection. Some of the cases have an abdominal onset and may lead to the erroneous diagnosis of 'acute abdomen' and surgical intervention. An early diagnosis is therefore necessary by combined clinical and laboratory examination, considerable importance attaching to the discovery of purpuric spots. Although these forms of meningococcal infection are usually rapidly fatal, Ameur's case, which occurred in a girl of 7 years, shows that recovery is possible as the result of treatment by transfusion, injection of antimeningococcal serum, and trypaflavine.

TREATMENT.—J. Cantacuzène⁷ reports the following three remarkably successful series of cases that were treated by *antimeningococcal serum*: (1) 43 cases in soldiers, with only 3 deaths; (2) 122 children, of whom 50 were in the first year of life—of the latter, 40 recovered and 10 died, and of the remaining 62, aged from 1 to 17 years, 12 died; (3) 8 cases, aged from 4 to 44, of whom only 1 died. Cantacuzène attributes these good results to observation of the following rules: (1) Intrathecal injection of serum as early as possible; (2) Daily injection of 25–35 c.c. of serum preceded by microscopical examination of the cerebrospinal fluid; (3) Cessation of the injections as soon as the meningococci have disappeared and the purulent character of the fluid has changed; (4) Injection of the serum as near as possible to the infected focus, e.g., into the ventricles in the case of infants; (5) Association of intramuscular or intravenous with intrathecal injections.

REFERENCES.—¹*Epid. Rep. Health Sect. League of Nat.* 1934, xiii, 1; ²*Bull. Off. internat. d'Hyg. publ.* 1933, xxv, 1721; ³*Rev. de méd. mil. Yougoslavi.* 1933, iv, 19; ⁴*Bull. Off. internat. d'Hyg. publ.* 1933, xxv, 1729; ⁵*Jour. Amer. Med. Assoc.* 1933, ci, 272; ⁶*Thèse de Paris*, 1933, No. 289; ⁷*Bull. Off. internat. d'Hyg. publ.* 1933, xxv, 1216.

CHICKEN-POX.*J. D. Rolleston, M.D., F.R.C.P.*

SYMPTOMS AND COMPLICATIONS.—A case of *congenital chicken-pox* is reported by A. K. Cosgrave and J. Samuel.¹ The mother was a Chinese woman, primipara, aged 19, who contracted chicken-pox a fortnight before delivery. At birth the female infant presented about twenty lesions in the papular and vesicular stages, and another crop appeared on the third day. Apart from fretfulness there was no constitutional disturbance. Syphilitic pemphigus was excluded by negative Wassermann and Kahn reactions in the mother's blood.

W. B. Henderson² records a case of chicken-pox in an 8-day-old male infant whose mother first noted an eruption on her thigh on the day of delivery. This is apparently the earliest example on record of varicella in a newborn infant. In Pribram's case, as well as in the one summarized above, the eruption was present at birth, while Senator's case developed the disease on the eleventh day.

P. P. Lévy,³ who reports a personal case, remarks that *second attacks* are very uncommon. [This accords with the experience of the reviewer, who has seen only a few cases of recent varicella with a history and scars of a previous attack.—J. D. R.] Lévy's patient was a girl, who at the age of 3 years had a typical attack of chicken-pox which left some scars on the trunk and right shoulder. Three years later she developed another attack of a milder character than the first after being exposed to infection by her brother, who had a confluent eruption.

A fatal case of *superficial abdominal gangrene* is reported by T. R. Nichols⁴ in a previously healthy girl, aged 11 years, who developed a horseshoe-shaped area of gangrene in the neighbourhood of an infected vesicle on the fourth day of an attack of varicella. The affected area was extensively excised down to the fascia, which appeared unaffected. No pus was present except for a drop beneath the infected vesicle from which streptococci were cultivated. Death, preceded by delirium, took place on the fifth day. There was no autopsy.

D. Corda⁵ reports three cases of *nervous complications* with an excellent review of the literature. His first case was that of a female infant, aged 21 months, who on the seventeenth day of disease developed symptoms of poliomyelitis in the right lower limb. Recovery took place in a fortnight. The second case was that of a girl, aged 3 years, who on the sixth day developed symptoms of cerebellar ataxy which subsided in about three weeks. The third case was in a boy, aged 4 years, and was also complicated by nephritis. Encephalitis developed on the sixth day and ended fatally. There was no necropsy, but the condition was probably due to a hæmorrhagic cerebral lesion.

According to P. A. H. Boquet,⁶ *encephalomyelitis* complicating varicella is generally mild and gradually retrogressive. Recovery is almost always complete and there are no sequelæ. A few cases, however, such as those of Debré, Lévy-Solal and Netter and Longchamp [as well as Corda's third case—J. D. R.], have proved rapidly fatal. In most instances the complication is associated with a slight or abortive eruption. The symptoms, which are very variable, consist mainly in headache, somnolence, transient ocular palsies, and choreo-athetotic or cerebellar manifestations. Paralysis of the limbs are rare. Although these cases seem to have increased since 1925, their number is infinitesimal compared with the amount of varicella seen every year. Boquet has collected 70 genuine cases from the literature, of which 33 were reported in 1930 alone. The pathological changes are chiefly found in the white substance of the neural axis, where they consist in perivascular infiltration, glial reactions, and a process of demyelination which exactly resembles post-vaccinal encephalitis. In the absence of experimental proof it is impossible to determine whether the nervous

complications of varicella are due to the virus of the acute exanthem or to a hitherto dormant unknown virus possessing neurotropic properties which is roused into activity by the attack of varicella.

REFERENCES.—¹*Malayan Med. Jour.* 1934, ix, 68; ²*Jour. of Pediat.* 1934, iv, 668; ³*Bull. Soc. de Pédiat. de Paris*, 1933, xxxi, 298; ⁴*Canad. Med. Assoc. Jour.* 1934, xxx, 297; ⁵*Arch. ital. de Pédiat.* 1934, ii, 286; ⁶*Thèse de Paris*, 1933, No. 359.

CHOLECYSTITIS. (See also GALL-BLADDER AND BILE-PASSAGES, SURGERY OF.)
Robert Hutchison, M.D., F.R.C.P.

J. M. Blackford, R. L. King, and K. K. Sherwood¹ have published the results obtained in the medical treatment of 200 cases of cholecystitis followed up after five to fifteen years. Treatment consisted in regulation of the diet by eliminating foods that the patient found to disagree, in the administration of morning salines, usually sodium phosphate, biliary salts before meals, and occasionally alkalis. Infective foci were removed and emphasis was laid on reasonable physical exercise. Medical biliary drainage was not employed. The results showed that 37 per cent of the patients were satisfactorily relieved; 48 per cent either came to operation later or should have been operated upon on account of continuation of symptoms; 15 per cent were dead, but only 1 per cent died directly from gall-bladder disease. The authors conclude that the patient with uncomplicated cholecystitis should be given a trial of medical treatment, but if not promptly relieved he should be operated upon.

B. B. V. Lyon and others² have found that dehydrocholic acid (*decholin*) is the most satisfactory and least toxic of bile-salt preparations. They have used it in cases of hepatitis, early cirrhosis, cholangitis, functional disorders of the liver, and biliary migraine. It acts only by its effect on the liver in thinning the bile, but does not appear to aid in the evacuation of gall-bladder bile. They gave two tablets (i.e., $7\frac{1}{2}$ gr.) after breakfast and supper for either five or six days in each week, with an interval of one week after the first hundred tablets have been used. After three or four hundred tablets had been given the dose was usually reduced to one tablet after breakfast and supper, and this was continued indefinitely.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, Sept. 16, 910; ²*Med. Record*, 1934, 123.

CHOLERA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Further work on variations induced in the cholera vibrio by the action of bacteriophages is reported by C. L. Pasricha and others,¹ as a result of which they classify vibrios into: (1) True cholera ones agglutinable by specific cholera serum; (2) The hæmolytic agglutinable El Tor vibrios, whose etiological relationship to cholera is unproved; (3) Those partially agglutinable by cholera serum, which may sometimes be obtained by the action of bacteriophages on true cholera vibrios; and (4) Vibrios not agglutinable by cholera serum, which may be found in nature unassociated with cholera or obtained by the action of bacteriophages. They also mention small coccal filter-passing forms which may develop into vibrios. They tested the action of bacteriophages on 56 non-agglutinable vibrios, and 11 of them became agglutinable after the action of cholera-phages, and another 13 through the action of non-choleraic vibrio-phages. The problem of the identification of cholera-causing vibrios is thus becoming more and more complicated.

Work on the antigenic structure of the cholera and other vibrios is recorded by R. W. Linton and others² in four papers. In the first they record that specific carbohydrates extracted from pathogenic and water vibrios in both forms, "an aldobionic acid made up of galactose and glycuronic acid", were

believed to be present, and "that a second sugar is also present; and that in some vibrios this sugar is galactose, while in other forms it is arabinose". The former was present in two strains of cholera vibrios, and the latter in two non-choleraic water vibrios, so the chemical composition may serve to differentiate them. In the second paper further analyses of the specific carbohydrates of four cholera and two water vibrios are recorded, and the latter again contained only arabinose, but two of the cholera ones also contained the same form, and the others galactose, so the analyses in this series failed to differentiate the two groups. In the third paper it is reported that substances tentatively identified as galactose and arabinose were obtained from rice-water stools of eleven cases of cholera. In the fourth communication analyses of vibrio proteins are dealt with in the case of six agglutinating and two non-agglutinating vibrios analysed by the van Slyke method, and the proteins were found to differ markedly in nitrogen distribution from other organisms that have been similarly analysed, and the evidence indicated that the vibrios have a relatively simple protein structure.

REFERENCES.—¹*Ind. Med. Gaz.* 1933, Aug. 448; ²*Ind. Jour. Med. Research*, 1933, July, 19, Oct., 379, 385, and 1934, Jan., 635.

CIRCUMCISION AND SYPHILIS. (*See* PENIS, SURGERY OF.)

CLEFT PALATE. (*See* HARE-LIP AND CLEFT PALATE.)

COLITIS, ULCERATIVE.

Robert Hutchison, M.D., F.R.C.P.

PATHOLOGY.—J. C. M. Brust and J. A. Barga¹ describe the pathological changes in the colon in 43 cases. They find that the development of true adenoma may follow chronic ulcerative colitis, though it is not common. Carcinomatous change is observed with great frequency compared with its appearance in colons which have not suffered from ulceration. In some cases there appears to be a transition through adenoma to carcinoma. In another paper L. A. Berie and J. A. Barga² deal with the microscopic changes in the colon in ulcerative colitis. The process begins as a diffuse inflammation usually affecting the lower part of the colon first. The affected area next becomes œdematous, miliary abscesses then form, and the rupture of these produces minute ulcers. They consider that diplostreptococcal infarcts play a part in the formation of the abscesses and that the disease is one of systemic origin.

M. Paulson³ reviews the experience of the disease at the Johns Hopkins Hospital. He regards it as a syndrome and denies that it has any specific etiology, bacterial or other. Recent work suggests that the greater and the more prolonged the bleeding, the greater will be the diminution of the intestinal flora and the more marked the relative increase in cocci. These cocci may be responsible for a secondary infection.

T. L. Hardy and E. Bulmer,⁴ in a survey of 95 cases observed over a period of twelve years, are of opinion that little has really been added to our knowledge of the disease during the present century. In their cases the sexes were equally represented, and the main incidence was in the age-period 21–40. One-third of the patients died during the period under review. The mortality was high during the first year (75 per cent), but diminished rapidly with every year of survival. The most unfavourable type is that with an acute onset; the least unfavourable is that characterized by intermittent attacks with complete freedom from symptoms between. There is general agreement as to the almost inevitable occurrence of relapses in this disease, and B. M. Banks and J. A. Barga⁵ have tried to determine the exciting cause of these in a large series

of cases. Amongst the commonest were infections of the upper respiratory tract, over-exertion and emotional upsets, gastro-intestinal derangements, and operations for removal of oral foci of infection. Recurrences were commoner in winter than in summer, and decreased with each decade of life. The situation and extent of the lesion did not influence the frequency of recurrences.

TREATMENT.—There is nothing new to report in treatment. Hardy and Bulmer⁴ state that the basic principles are rest in bed for a minimum period of six months, a well-varied diet of high calorie and vitamin content, the judicious use of opium to control diarrhoea, and the provision of an adequate supply of fluid to the tissues. They are not convinced that serum treatment or operation has materially improved the outlook, though both sometimes give brilliant results. They emphasize two facts: that recovery is always slow and rarely complete; and that there are few diseases in which a patient can reach such a state of emaciation and exhaustion and yet recover. Patience is requisite and hope justifiable in quite unusual degree.

REFERENCES.—¹*New Eng. Jour. Med.* 1934, March 29, 692; *Jour. Amer. Med. Assoc.* 1933, Nov., 1462; ²*Ibid.* Nov. 25, 1687; ³*Brit. Med. Jour.* 1933, Nov. 4, 812; ⁴*Arch. of Internal Med.* 1934, Jan., 131.

COLON, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Redundant Cæcum.—One frequently encounters during a laparotomy, especially in women, a greatly dilated and elongated cæcum, which gives rise to vague pain and tenderness in the right iliac fossa, loss of appetite, and constipation. It is, of course, part of a general visceroptosis, and is often confused with chronic appendicitis. H. V. Sharp,¹ of Akron, Ohio, advises cæcoplication for these cases; that is, after removing the appendix, the cæcum is plicated and shortened by sewing two of the longitudinal muscular bands (tæniæ) together, thus turning in part of the cæcal wall. [When this condition of the cæcum has been found at operation for supposed chronic appendicitis, I have practised cæcoplication, in the few cases that are suitable for it, over many years, and have been well satisfied with the results. It is much less drastic than Waugh's cæcopexy.—A. R. S.]

Inflammatory Swellings of the Colon.—Several authors contribute papers on this uncommon condition. The swellings are not due to ulcer, tubercle, or diverticulitis. They are likely to be confused with carcinoma. Stenosis is common. L. Ginsburg and G. D. Oppenheimer,² of New York, report 52 cases, and G. Anschütz,³ of Kiel, 12 more.

Diverticulitis.—Some idea of the relative frequency of the varieties of this condition is given by the figures of H. C. Edwards,⁴ of King's College Hospital. Amongst cases diagnosed as diverticulosis or diverticulitis in the wards there were:—

Cases of simple diverticulosis	111
Cases of diverticulitis	19
Obstruction, large bowel	6
Obstruction, small bowel from adhesions ..	1
Acute perforation	4
Abscess	3
Abscess with secondary perforation into peritoneum	2
Fistula into the bladder	2
Fistula into the bladder and abscess in the pelvis	1
Total	19

The main treatment of uncomplicated cases is directed to the prevention of complications. Colonic lavage should be insisted on; probably ordinary tap

water is as good as anything; not more than two pints must be used, and the head of water should not exceed 18 in. The diet should be mainly vegetarian, but avoiding excess of cellulose. If on account of obstruction or other complications surgery is called for, excision is the best treatment, but is by no means always possible, and colostomy must be resorted to. It is essential that the stream of faeces should be entirely diverted by an operation as for permanent colostomy, and one must be prepared to keep it open for at least twelve months. For acute obstruction a multiple-stage excision is best, if it can be done. Acute perforation presents a difficult problem; if the perforated diverticulum can be found and closed, that is of course the right thing to do. If not, a colostomy is to be made, omentum sutured over the danger area, and drainage instituted. Abscess cases call for drainage of the abscess, and for a colostomy, made either at the same time, or, usually better, on a later occasion. Colo-vesical fistula is a distressing complication, but the bladder usually acquires a considerable tolerance after a time, and in view of the difficulties and dangers of operative interference it is often wiser to let the patient alone, and content oneself with lavage; colostomy is disappointing; and radical cure of the fistula carries a high mortality.

Multiple Adenomatosis.—According to J. P. Lockhart-Mummery⁵ this may be definitely a familial disease, like hemophilia or albinism. The growths begin to appear at the age of puberty, and may be so numerous as to be uncountable. The symptoms are like those of ulcerative colitis, and the diagnosis is readily made with the sigmoidoscope, or, often, by X rays after a barium enema. There is, of course, a marked tendency for cancer to develop. The treatment advised is a total colectomy, combined with local removal, from time to time, of any adenomata that may form in the rectum. The best age for the operation is about twenty. None of the patients showed any lack of nutrition as a result of the operation.

Carcinoma.—This is not infrequently multiple in the colon; A. J. Cokkinis⁶ relates four original cases. A study of the metastases is published by Shields Warren⁷; in 156 cases there were 47 with secondary deposits in the liver, 26 in the lung, 16 over the peritoneum, and only one or two each in the pancreas, spleen, adrenal, kidney, heart, and bony skeleton.

D. P. D. Wilkie⁸ writes on the surgical treatment. He again refers to his high opinion of the value of prophylactic inoculation with a vaccine against *B. coli* and streptococci, and an injection of nucleinate of soda. At operation, the bowel must be freely mobilized, and the longitudinal tæniæ divided to get rid of sacculation. A large cæcostomy should be established to prevent gaseous distension. Resection was mostly done, at any rate of late years, by bringing out two ends of bowel after removing the growth and clamping them for a few days flush with the skin. Of the 101 cases, 15 died, 17 were lost sight of, 8 died of recurrence, 8 died of unconnected causes, and no fewer than 33 are alive and well (12 under three years, 14 over seven years).

REFERENCES.—¹*Amer. Jour. Surg.* 1934, April, 94; ²*Ann. of Surg.* 1933, Dec., 1046; ³*Deut. Zeits. f. Chir.* 1934, June, 377; ⁴*Brit. Med. Jour.* 1934, i, 973; ⁵*Ann. of Surg.* 1934, Jan., 178; ⁶*Brit. Jour. Surg.* 1934, April, 570; ⁷*New Eng. Jour. Med.* 1933, July, 167; ⁸*Lancet*, 1934, i, 65.

CONJUNCTIVA, DISEASES OF. *Sir Stewart Duke-Elder, M.D., F.R.C.S.*

Trachoma.—A paper by P. Thygeson¹ is of great interest in the controversy noted in the MEDICAL ANNUAL for 1931 (p. 109) following the claim put forward by Noguchi that the cause of trachoma was *Bacterium granulosis*. Thygeson found experimentally that inoculations of this bacterium failed to produce trachoma in five different persons, although susceptibility to the disease in

one of the subjects was later proved by positive results from a direct inoculation with follicular material from a person with active trachoma. Moreover, material from monkeys with active conjunctivitis caused by this germ was directly transferred to two human subjects: in both of them a mild conjunctivitis developed which subsided without treatment. These experiments, and particularly the latter, suggest very strongly that *B. granulosis* is not the etiological agent of true trachoma.

Gonorrhœal Conjunctivitis.—For a number of years W. A. Wille² has been employing *anti-gonococcic serum* as an instillation into the conjunctival sac in gonorrhœal conjunctivitis, apparently with considerable success. The well-known difficulty in treating this conjunctivitis makes any well-attested remedy worthy of note. The serum used is the stock material of Parke, Davis & Co. The application must be made carefully, after the conjunctival sac is well washed with boracic solution and dried, and this is repeated two or three times during a day and night: there is no pain or irritation and no harm is done to the cornea. Careful continual cleansing and the application of protargol is also recommended in addition to the serum; while in very severe cases the suggestion is made of injecting the serum hypodermically.

REFERENCES.—¹*Arch. of Ophthalmol.* 1933, x, 1; ²*Brit. Jour. Ophthalmol.* 1934, xviii, 218.

CONTACT GLASSES. (*See CORNEAL CONTACT GLASSES.*)

CONVULSIONS IN THE NEWBORN. (*See INTRACRANIAL INJURY IN THE NEWBORN.*)

CORNEA, DISEASES OF. *Sir Stewart Duke-Elder, M.D., F.R.C.S.*

Band-shaped Keratitis.—Two papers of considerable interest describing band-shaped keratitis have appeared during the past year. While the real cause of the condition is unknown, cases may be divided into three groups—primary, secondary, and traumatic. The primary form usually occurs in old people, and is probably a nutritional defect. The secondary form—which is the most common—follows as an end-result in old cases of iritis and glaucoma. The traumatic form follows as the result of irritants met with commercially. In each case the opacity appears in the inter-palpebral space running across the cornea; it is situated under the epithelium, destroying Bowman's membrane, and sometimes reaching a considerable depth in the corneal stroma. Originally the change is probably hyaline in nature, but ultimately the deposit consists essentially of calcium carbonate.

The case reported by F. B. Walsh and E. Chan¹ is unusual in that it seemed to be of the primary type occurring in a youth of 18 years, the child of a consanguineous marriage. An unusual feature was the occurrence, in addition to the corneal condition, of an accompanying thickening of the conjunctiva, which bulged over the cornea in massive white folds. Histological examination indicated that the changes were due to a hyaline degeneration of the subepithelial connective tissue.

In a second paper R. J. Sisson² has given the analysis of the degenerated tissues removed from the glaucomatous eye of an old woman: the material was examined with the polarizing microscope and by means of X-ray spectra. Calcium was found in quantity as well as phosphorus, with small amounts of sulphur and silicon.

Treatment of the condition is by scraping with a sharp spoon, when the calcareous substance may be chipped off, although it is sometimes fairly firmly united to the anterior layers of the substantia propria. After the removal

of the band the cornea underneath is clear, and there is no tendency to recurrence.

Herpetic Keratitis.—R. Schmidt³ describes in considerable detail the occurrence of an epidemic of herpes of the cornea which occurred in Freiburg in 1932. It is interesting that catarrhal or febrile diseases occurred only in 20 per cent of the patients. The usual ocular manifestation was a superficial punctate keratitis, wherein small epithelial erosions of considerable chronicity and involving much pain and photophobia occurred all over the cornea. Dendritic ulcers and disciform keratitis were less commonly observed, but in two interesting cases the transition from a superficial punctate to a disciform type was observed, the isolated lesions of the former coalescing to form the irregular ulcers characteristic of the latter condition.

A much rarer and very interesting manifestation, which is characterized by a striated appearance, developed in four cases, which are reported and illustrated by five pictures. The striation consisted of parallel and crossing lines, which were composed of minute dots which stained with fluorescein, and were limited to the epithelium. The sensitivity of the cornea was reduced; pain was present at the onset and when recurrences occurred. Other symptoms confirmed the herpetic nature of this striated keratitis. It was temporarily accompanied by superficial punctate keratitis in three cases. Scrapings of the diseased cornea from the third case, inoculated into the cornea of a rabbit, produced the same eruption. Filaments developed on the epithelium of the cornea in two cases. In one of these, furthermore, there was a hæmorrhagic iritis, termed 'herpetic' by Gilbert and other writers. These observations lead Schmidt to believe that many of the related cases described by Caspar, Haab, Spicer, and Greeves, belong to the same category. The author concludes that herpes of the cornea is not of trophoneurotic origin, but is caused by a specific virus. No explanation can be given whether mechanical, chemotactic, or nervous influences are responsible for the striated arrangement.

Arsenical Poisoning Involving the Cornea.—Arsenic poisoning is seen with comparative frequency in medical practice and may be acquired in many ways, as (1) with suicidal intent, (2) through the medicinal use of arsenic, and (3) accidentally. The manifestations of arsenic poisoning are varied, but in the medical literature there could be found reports of only four cases of arsenic poisoning involving the cornea, and all of them resulted from the use of arsenicals in the treatment of syphilis. The case described by A. V. Hallum⁴ followed the eating of peaches from a tree which had been recently sprayed with insecticide. The patient presented most of the text-book symptoms of chronic arsenic poisoning, including a conjunctivitis and an exfoliative dermatitis. The tension of the right eye was normal. The cornea was grey, dry, lustreless, and almost insensitive, and in its lower two-thirds was more densely opaque than in its upper one-third. The cornea did not stain with fluorescein. The anterior chamber was of normal depth, and the pupil as seen through the upper part of the cornea was round and active. The iris appeared normal. The left globe was shrunken and soft, and the cornea was almost flat, exhibiting a similar but more advanced condition than that of the right cornea. There was a dense central adherent leukoma.

The left eye was enucleated, and histological examination showed that the corneal surface was irregular and covered by several new layers of epithelium. The epithelium varied much in thickness, and the outer cells were flat and translucent, not unlike epidermis. Bowman's membrane was completely destroyed, and almost all of the outer third of the stroma was replaced by vascular fibrous tissue. Descemet's membrane was present but wavy because

of the contraction of the cornea. Through the centre of the cornea was a scar from an old perforation, from which a dense band of fibrous tissue passed posteriorly to the nerve head. The atrophied iris and ciliary body were drawn into the mass of fibrous tissue and extended into the cornea. The retina was completely detached and caught in the strand of fibrous tissue that had contracted and drawn the nerve head into the vitreous cavity. The choroid was atrophic and attached to the sclera.

This condition corresponds essentially with the other four cases found in the literature—an exfoliative keratitis, followed by ulceration which may go on to necrosis, sloughing, and ultimately perforation. It seems probable that the corneal changes may be due to actual toxic degeneration and an exfoliation involving the corneal epithelium similar to the cutaneous lesions, followed by secondary infection, but it is quite likely that trophic changes following the disturbance of sensation should also be considered. Probably the best form of treatment of this corneal complication is the surgical removal of the diseased epithelium followed by the application of 3.5 per cent solution of tincture of iodine. Conjunctivitis during the course of arsenical treatment of syphilis may be a warning to lengthen the interval between injections.

Corneal Ulcers.—Two papers on the treatment of corneal ulcers have appeared—one by H. F. Whalman,⁵ of Los Angeles, and the other by P. J. Hay,⁶ of Sheffield—emphasizing the value of non-specific protein therapy in this condition; it is especially valuable in severe cases of hypopyon ulcer. Whalman reviews critically the different methods of treating such ulcers. He finds that antiseptics are more effective if the conjunctival sac is first cleansed by mild silver nitrate, which forms a coagulum of the detritus, which can then be evacuated by irrigation. Trichloroacetic acid is perhaps the most generally applicable of the chemical agents for the cauterization of ulcers; it leaves a relatively thin scar, and Whalman considers it better than the more usual carbolic acid.

The thermophore is the most accurate means of applying heat of a known temperature for cauterization of ulcers, and is particularly valuable in ulcer serpens, dendritic ulcer, and certain indolent ulcers. Phototherapy (*see* MEDICAL ANNUAL, 1931, p. 118) offers some distinct advantages in requiring less manipulation and causing less pain and less scarring. Non-specific protein therapy is a distinctly beneficial adjuvant to treatment, and should always be given in cases of ulcer serpens and gonorrheal ulcer. Milk is less constant in its action than typhoid vaccine administered intravenously. Certain surgical measures are of value, such as paracentesis when perforation is imminent, and the use of the sliding conjunctival flap when large areas are involved, as well as for impending perforation.

REFERENCES.—¹*Amer. Jour. Ophthalmol.* 1934, xvii, 238; ²*Ibid.* 222; ³*Klin. Monats. f. Augenheilk.* 1933, xci, 47; ⁴*Arch. of Ophthalmol.* 1934, xii, 93; ⁵*Calif. and Western Med.* 1933, Sept., 181; ⁶*Medical Forum*, 1933, Oct.-Dec., 410.

CORNEAL CONTACT GLASSES. *Sir Stewart Duke-Elder, M.D., F.R.C.S.*

A 'contact glass'—whereby a glass is placed in close apposition to the cornea and so eliminates any irregularity in its refraction—is a conception of considerably old standing which has entered into the sphere of actual practice only recently. It is known that the younger Herschel, the astronomer, attempted to produce such a glass in 1827, and as early as 1887 Fick succeeded in doing so. Soon afterwards, Müller (1889) succeeded in association with Himmler of Berlin in producing blown contact glasses, while Sulzer (1892) had contact glasses ground for him. It was not until recent years, however, that owing to the labours of Heine, of Kiel, in association with the firm of Zeiss, of Jena, that this difficult optical problem was solved in a way sufficiently

practicable to allow contact glasses to be used not only in the correction of refractive errors so difficult that ordinary spectacles are of little use, but also therapeutically in diseases of the cornea and as an aid to corneal surgery.

Blown Contact Glasses.—Blown contact glasses, which were first produced by Müller in 1887, are still made by one or two German firms. In appearance a glass resembles an artificial eye, consisting of a central transparent corneal portion and an opaque scleral rim, marked with indications of conjunctival vessels to make it look inconspicuous. It is inserted in the same way as is an artificial eye: the glass is moistened with saline, the upper rim is pushed under the upper lid as the patient looks up, and the lower rim is pressed into the lower fornix, the eyelid being drawn down and allowed to spring back into position over the glass. There ought to be close contact between the glass and the cornea: no fluid meniscus is interposed and no air bubble must be present. To obtain a proper fit—wherein no sensation of pressure on the cornea is felt by the patient, and yet the glass fits snugly enough to avoid movement and chafing of the conjunctiva—necessitates a process of trial and subsequent correction. The making of the glass is therefore empirical, and the refracting power and correcting capacity must be determined beforehand.

It will be realized that the blowing of an adequately fitting contact glass represents the highest expression of the glass-blower's art. The very complicated shape of the glass, with its necessarily accurate corneal and scleral curvatures, the maintenance of the required thickness, and the determination of the radii of curvature of the inner and outer surfaces have all to be achieved and maintained by the technique of the glass-blower himself from the molten glass. It is not surprising therefore that their production and use has been strictly limited. Nevertheless, although first designed for protection purposes in cases such as lagophthalmos, neuroparalytic keratitis, entropion, and trichiasis, they have been employed with considerable success as an optical aid in gross refractive errors, such as high myopia, conical cornea, and irregular astigmatism due to leucomata resulting from injury or disease.

Ground Contact Glasses.—Ground contact glasses, which can be made to standard measurements, and thus can be made in series in bulk, are of more practical utility; but even these, which require to be ground in a complicated form involving two curvatures (that of the corneal and the scleral portions) which must be of mathematical exactitude, and so highly polished as not to cause irritation to the eye, had to wait for a very long time before optical technique had developed to a stage of sufficient exactitude to deal with them. It is only recently that the firm of Zeiss have been able to make them a practical proposition. The glasses of Zeiss are of two parts: a spherical corneal portion, having a diameter of approximately 12 mm. and a vertex thickness of 0.5 mm., surrounded by a peripheral scleral rim having a diameter of 20 mm. and a thickness at the edge of 0.3 mm. The scleral rim rests upon the sclera, and the corneal part lies on top of the cornea separated from it by a fluid meniscus (*Fig. 11*). The optical function of the glass is to

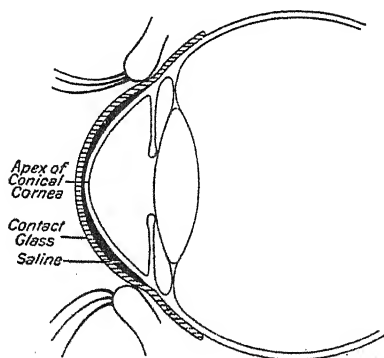


Fig. 11.—Diagram showing contact glass in position over a conical cornea, a layer of saline intervening. (By kind permission of the 'British Journal of Ophthalmology'.)

maintain on the outer side of the cornea a fluid having a refractive index equal to that of the aqueous humour, so that, by having a medium of equal refractivity on either side of it, the refraction of the cornea is abolished; consequently, since the irregular air-corneal interface is abolished from the optical system of the eye and is replaced by a regular air-glass interface, the only optical irregularities which remain (neglecting opacities of the media) are the small astigmatic defects of the lens.

The Fitting of Contact Glasses.—The insertion of contact glasses is not always an easy matter, especially if the patient is of the apprehensive type. Several methods have been suggested to facilitate it, the most usual being by the use of a small rubber sucker. The sucker is applied to the convex surface of the glass, which is then held inverted by the attached bulb and filled with saline. The patient then leans forward until his face is horizontal, and while in this position, looking directly into the glass, the lids are separated with the fingers, and the glass containing the saline is steadily approximated to the cornea. First the lower rim is inserted into the inferior fornix, and then the upper rim is eased under the upper lid, whereupon both lids are swept over the glass and the suction bulb removed. It will be realized that any abrupt movements, and any attempt on the part of the patient to squeeze the lids, will result in some of the saline being spilt, with the consequence that an air bubble will be admitted between the glass and the eye—an accident which destroys the optical properties of the system and necessitates the glass being removed and applied again. Certainly for the initial attempt, therefore, and in almost all cases for a considerable time thereafter, the eye should first be anæsthetized with holocaine before the glass is inserted, and the saline employed should always be of body temperature.

The original method for removing a glass was with the aid of an ivory peg which was inserted under the rim of the glass. As this, however, may injure the cornea and snip the edge of the glass, it is best to use a sucker for its removal: the glass is fixed by this, and when the head and eyes are moved to the side, it is readily slipped off when the lower lid is held down.

The Prescription of Contact Glasses.—In the prescription of contact glasses two separate considerations have to be borne in mind: the fitting of the scleral rim to the eye, and the optical correction, and since it is its comfort which determines whether or not the patient will wear the glass, the most important of the two is to secure good and comfortable fitting.

The glasses of Zeiss are supplied in three standard sets, each set comprising the whole range of corneal curvatures, and differing in scleral curvature. The radii of the inner scleral curvatures are 11, 12, and 13 mm., and half-millimetre subdivisions are also available. An accurate fit is usually obtained by a method of trial and error: a glass is inserted and the fit of the scleral rim carefully examined, either by the slit-lamp or by the loupe—there should be a complete zone of adhesion round the limbus, for if the edge presses more securely upon the sclera than the inner part of the rim upon the limbus, the rim invariably rubs the eye and irritates.

To avoid the necessity of using trial glasses, Prister (1933) has suggested the expedient of taking a mould of the anterior segment of the eye in dental wax. A thin oval plate carrying the wax is slipped under the lids and pressed against the globe, the wax being kept soft meantime by cotton-wool pads soaked in warm saline. When the mould is taken the application of cold pads harden it and the plate is removed. From this as a negative, a model of the anterior part of the eye is cast in plaster, from which the glass can be made. Von Capsody (1929) used a paraffin mould in much the same way.

The problem of the prescription of the corneal curvature involves two

questions: the production of the maximal optical effect, and the choice of a glass which does not press upon the cornea itself, a factor which becomes important in pronounced cases of conical cornea. The general principles followed in the prescription are to find the corneal curvature which most nearly approximates the optical error of the eye, to improve on the visual result which this gives, if possible, by placing plus or minus lenses in a trial frame (it will be remembered that all astigmatism is abolished), and finally to incorporate this additional correction into the curvature of the contact glass. It is possible to determine the nearest corneal curvature by a process of trial and error, and this is the only method available if the astigmatism is quite irregular, but if it is possible, much time and discomfort to the patient is saved if the corneal radius of curvature is measured by the ophthalmometer.

If the astigmatism is irregular and the corneal curvature cannot be satisfactorily determined, a test glass can be taken at random, and subjective tests made with spheres until the maximum vision is obtained. This is incorporated into the prescription, together with a note of the distance between the contact glass and the posterior surface of the lens in the trial frame so that a vertex correction may be applied. This may be measured by a keratometer or by a rule like that suggested by Rugg-Gunn (1933). It is to be remembered that it is inadvisable to order a higher correction than ± 4 D to be ground into the final contact glass, since the extra weight adds to its inconvenience; occasionally it may be necessary, as the shallower glasses (of radius 9, 10, or 11) sometimes touch the apex of the cornea, especially in cases where it is conical. Careful examination in the beam of the slit-lamp should always exclude this possibility when the trial glass is fitted and before the final lens is ordered. Although damage need not necessarily follow prolonged pressure of the glass upon the apex of the cornea (Rugg-Gunn, 1931), it is safer to avoid it, and to choose a contact glass of deeper curvature, correcting the residue of error by grinding a lens of sufficient power on its outer surface. The complete prescription, therefore, for the provision of a contact glass includes: (1) The scleral curvature; (2) The corneal radius of the glass required; (3) The amount of any additional correction; and (4) The vertex distance at which the additional correction was tested.

The Uses of Contact Glasses.—The uses of contact glasses are two-fold—optical and protective. As optical instruments they undoubtedly form the ideal correction for ametropia and are free from many of the disadvantages of spectacles. The fitting of a spectacle lens some distance from the eye entails several optical disabilities. One is a change in size of the retinal image: a corrected myopic eye receives a larger retinal image than does a normal eye; and a corrected hypermetropic eye the reverse. Owing to the fact that the positions of the cardinal points are little displaced when the correcting lens is in apposition to the cornea, this error does not arise, and visual judgements are consequently rendered more accurate. One of the great disadvantages of anisometropia is thus overcome, and, in the extreme cases, binocular fusion can be obtained in unilateral aphakia. The diplopia which results from an attempted correction of this condition is due partly to the irregularity of the retinal images and partly to the displacement of the image in the aphakic eye by the prismatic effect of a strong convex lens when the visual axes are deviated to any extent; both these difficulties are overcome with the contact glass. A second grave disadvantage of spectacles of any strength is the diminution of the field wherein good vision is possible owing to the failure of the lens to move with the eye. This again is overcome by the contact glass. In the same way difficulties caused by the astigmatism of oblique rays of incident light are minimized.

From the theoretical point of view, therefore, owing to the elimination of the corneal astigmatism and the elimination of an optical system having a fixed and movable constituent, the contact glass has many advantages over the spectacle lens. The most debilitating type of refractive error is abolished; an appreciation of perspective and judgement of distance equal to that of the emmetrope is conferred upon the hypermetrope, not only with regard to unioocular, but also in respect of binocular vision; uniformity in the size of retinal images is secured, so that binocular vision is possible in anisometropia, and the field of vision is greatly increased. A further advantage is that, since they are maintained at body temperature, rain and fog do not condense upon them as they do on spectacle lenses.

Their essential value is in case of corneal astigmatism so extreme that spectacle correction is of little use. This is typified in conical cornea, in cases of which a visual acuity with spectacles of less than 6/60 can frequently be brought up to 6/5. In addition to this, their use in aphakia may be suggested, while the aid to binocular fusion and the increased field of vision may be cited as indications for their use in sports.

Against these advantages several disadvantages must be weighed. The first of these is the difficulty of their manipulation by the patient and the discomfort which their wearing causes many people. There are many people who seem never able to deal with them; they find them impossible to insert and intolerable to wear. Others, again, readily fall into their use, and seem to wear them without discomfort; to a large extent the matter is a psychological one. A second most important factor is the scleral fit; while any chronic conjunctival irritation or mild conjunctivitis adds greatly to the patient's difficulties.

A second disadvantage is their great expense. To procure a complete trial set for fitting purposes is itself a large order, while each glass costs the patient £4 approximately. In this connection it is to be remembered that in manipulation the delicate glasses are easily broken. To a certain extent this is a disadvantage which will rectify itself as the optical principles upon which they are founded get more widely disseminated, but it cannot be expected that an optical product requiring such accuracy and technical skill and necessitating the use of specialized instruments in its manufacture will ever be cheap.

A third point which arises is the danger to the eye by their pressure, and the potential danger if they break. With regard to the first point the danger seems small or non-existent. Cases are recorded in which they have been worn daily for periods of twenty years or over. Rugg-Gunn (1931) notes an instructive case of conical cornea where a glass which pressed upon the apex of the cornea had been worn for fifteen years, and although examination by the slit-lamp showed definite signs of pressure at the apex of the cone, no damage could be detected. Successful cases have been reported by numerous authors (Siegrist, 1920; von Hippel, 1919; Dohme, 1922; Heine, 1930-1; Hartinger, 1930; Rugg-Gunn, 1931; von den Heydt and Gradle, 1930; Beaumont, 1931; Deutsch, 1929; Katz, 1931; Rycroft, 1932; Sitchevska, 1932; and many others). On the other hand the literature, and the practice of everyone who has tried them at all extensively, contain cases, probably as numerous, where they could by no means be tolerated.

With regard to any danger arising from their breakage, this is probably small. The contact glass is well protected in the orbit, and compares very favourably in this respect with a spectacle lens. If one were to be broken in the eye it is probable also that the risk of penetration of the cornea would be small—again smaller than in the case of a spectacle lens. Rugg-Gunn draws an interesting analogy in this connection: if a thin cover-glass is smashed as it lies

in the hand, the skin probably escapes injury, but if a glass is fixed an inch away and then broken by a blow which tends to drive the particles of glass towards the hand along the direction of force, the chances are that some of the fragments will be driven into the skin. The former example is analogous to the contact glass, the latter to a spectacle lens.

Apart from their optical value, contact glasses can be put to further uses, some of which may be briefly summarized:—

1. In many varieties of keratitis, especially those of the neuro-paralytic and degenerative type, they may be employed to protect the corneal epithelium.

2. In severe corneal ulcers, they have been employed to ensure continuous application of an antiseptic ointment to the cornea.

3. In plastic operation on the cornea, particularly in grafting ulcers, they have successfully been used in keeping the graft of conjunctiva or cutaneous epithelium (Wright, 1932) in position.

4. They may be employed to give comfort in cases of severe blepharospasm and photophobia, such as in phlyctenular keratitis.

5. They have been employed when tinted with a peripheral iris-shaped ring to relieve the symptoms of photophobia in albinism (Asher, 1930).

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CORONARY ARTERY DISEASE.

A. G. Gibson, M.D., F.R.C.P.

The differentiation of pulmonary embolism from coronary artery thrombosis as a sudden cardiac event is sometimes difficult. S. H. Averbuck,¹ with a record of six cases (all fatal with post-mortems), attempts to make the clinical distinction. Pulmonary embolus induces a syndrome in which there is sudden onset of painful oppression in the chest with extreme cyanosis and dyspnoea. The pain has no typical radiation and has been described as a strangling sensation, though the *angor animi* is as profound as that which occurs in angina pectoris or coronary thrombosis. Shock is present as in coronary thrombosis, and in many cases death occurs almost immediately. The diagnosis depends on being aware that the two conditions may be mistaken for one another, on features that are atypical for coronary thrombosis, on the presence of thrombosis or a recent history of it, and especially on the history of a recent operation. The two states, as in two of the recorded cases, may coexist, so that an electrocardiogram which might clearly point to coronary thrombosis may mislead. In three cases in which electrocardiograms were obtained in pulmonary embolism, in one the T 3 was slightly inverted, in the second the T 1 and T 2 were partly inverted, and in the third there was a partial inversion of the T wave in Lead I.

J. Hay,² in the St. Cyres Lectures on certain aspects of coronary thrombosis, describes an *atypical form* in which the pain of an anginal type is persistent

and usually in the sternal site with the normal lines of radiation. The pain frequently arises spontaneously and persists in spite of rest. In the mildest cases the distress may be so slight that this significance is overlooked. Careful search for corroborative signs, especially in the electrocardiogram, the presence of pyrexia, pericardial friction, or moderate leucocytosis may give the clue—and also careful cross-examination of the patient. In the atypical form in which pain is absent, dyspnoea and shock are the most important features. There may also be waves of faintness, syncopal attacks, or a feeling of weight in the epigastrium. Dyspnoea is especially significant in those cases in which an abdominal lesion such as cholecystitis may be confusing. Pulmonary embolism with faintness may sometimes simulate coronary thrombosis. The first clinical effect may be a cerebral attack from an embolism. In these cases, however, a careful search of the lungs for evidence of infarction and of the peripheral veins for thrombosis should be made. Coronary thrombosis is rare under 40 and in those suffering from sclerosing endocarditis due to rheumatism or syphilis. A familial tendency to arterial complications may also be found. With regard to the electrocardiogram, in some patients the records become normal, but this is the exception. It is probably true to say that a minimum area of the myocardium must be affected to produce an alteration, though a smaller area than this may still cause pain. The question whether there are silent areas in the heart may possibly be answered by saying that the lesion does not affect the electrocardiogram with the ordinary leads. Smallness of the infarct and a collateral anastomosis are the features which tend to lessen the changes in the electrocardiogram. The diagnosis of a minimal or aberrant type of coronary thrombosis must be based chiefly on clinical grounds. The electrocardiogram may give a decisive answer when the diagnosis is in doubt, but more usually it provides confirmatory evidence.

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CYCLICAL VOMITING (SO-CALLED ACIDOSIS) IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

The use of the term 'cyclic vomiting' continues to put a strain on authors writing on the subject of periodic vomiting and other attacks. In spite of its appearance at the head of this paragraph the present writer¹ has begged for the discontinuance of the term 'cyclic vomiting' on the grounds that it is outgrown whatever usefulness it may have possessed. W. G. Wylie and B. Sehlesinger² write under the title of "The Periodic Group of Disorders in Childhood"—not, perhaps, much of an improvement. K. Tallerman³ prefers the phrase 'recurrent vomiting attacks' as getting rid of the idea of any regularly recurring cycle in these cases; but the reviewer must be pardoned if he points out that this periodicity was emphasized in Gee's original description. We have doubtless passed far beyond anything to which Gee would have limited his syndrome. Any child who happens to have been sick more than once in its life is now dubbed a case of cyclic vomiting, and indeed it is not even necessary for the child to go through the formality of vomiting: unexplained attacks of diarrhoea or of fever are sufficient for a diagnosis of acidosis.

K. Tallerman³ discusses two interesting aspects of the problem of recurrent vomiting attacks. He has looked in a series of such cases for evidence of allergy, and beyond being able to trace allergic manifestations in the family histories, he has found no definite evidence of allergy to account for the symptoms in the affected children themselves. Even where a food was suspected

as the cause of attacks, its discontinuance brought no relief. Skin-testing in these children proved to be of no assistance. His second point concerns the possible association between vomiting attacks and migraine. It is, of course, well known that migraine may be mistaken for cyclical vomiting; though in ordinary migraine the prostrating headache precedes the vomiting quite distinctly, which is not the sequence of events in cyclic vomiting. Tallerman's point is, however, rather different from this, and he suggests that the vomiting attack may be an atypical manifestation of migraine, a substitution for it. He approves of the modern plan of diminishing the fats in the diet of these cases.

The present writer¹ has reviewed the subject of "so-called acidosis in children", and has endeavoured to make the following points. First, that there is no evidence that the vomiting attacks are primarily due to an acidosis in the form of a ketosis, and in withdrawing fats and increasing sugar we have a plan of treatment with no real malady attached to it. Secondly, that many attacks are really due to some discoverable condition, of which chronic appendicitis is one. Thirdly, that in the absence of any organic cause, the underlying cause is usually intestinal indigestion and toxæmia, as will be discovered by the abnormality of the stools and the presence of indicanuria. The exciting cause of the attack is a dose of toxin from the intestine larger than the liver can deal with; hence the hepatic symptoms, such as fatty pale stools, which initiate the attack. It is to this that the value of feeding glucose to the child is to be attributed. It is known that a liver with a good supply of glycogen is less easily poisoned than one in a deglycogenated state. In the reviewer's opinion wholesale cutting-down of the fats of the diet is unnecessary and often harmful: cooked fats (roasted or fried) should be limited, but ordinary amounts of uncooked fats (milk, butter) may be allowed.

REFERENCES.—¹*Brit. Med. Jour.* 1933, ii, 1103; ²*Brit. Jour. Child. Dis.*, 1933, xxx, 1; ³*Brit. Med. Jour.*, 1934, ii, 767.

CYSTICERCUS EPILEPSY. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

In a remarkable paper W. P. MacArthur¹ furnishes conclusive evidence that *Cysticercus cellulose* occurring in the brain is a frequent cause of epilepsy in British soldiers who have served in India, for he has met with over sixty proved cases in the last few years, mostly during eighteen months when all cases of epilepsy in the British Army were sent to the Milbank Hospital for special investigation on account of cases having been met with by him and by R. Priest in which numerous such parasites were found in the brain in fatal epilepsy, and numerous subcutaneous nodules due to cysticercus had been noted in cases during life. Moreover, out of 8 men returned from India in the last troping season, who have been proved to suffer from cysticercosis, 6 had been invalided for epilepsy and the other 2 had been under observation for some kind of seizure, and it is known that the cysticercus stage of *Tania solium* readily develops in man and has a special predilection for the grey matter of the brain. Prodromal symptoms appear to be rare, and cysts may be present in large numbers in the body without being evident externally, and if they calcify they may be discovered later by X-ray examination. The cysts may continue to appear in the subcutaneous tissues or muscles, especially in the upper half of the body, singly or in crops over a period of years. When the parasites die the cyst becomes more tense and evident, and this may be the cause of the appearance of epileptic symptoms. In the brain a wall of sclerosed neuroglia surrounds them, as many as 200 having been present in one brain, so they must cause little disturbance as long as they are quiescent, and they only appear to act as foreign irritants, as a rule, when they die. Periods of

exacerbation and quiescence occur which have led to diagnoses of delusional insanity, disseminated sclerosis, or cerebral tumour. Calcification appears to begin in the scolex, and probably takes about three years to complete after the death of the cysticercus, and the X-ray appearances include oval, elongated, linear, or irregular-shaped bodies from 1 to 23 mm. long and 1 to 7 mm. broad, which are of great diagnostic importance, in addition to the finding of actual cysts.

The clinical conditions produced by the involvement of the brain include, in addition to minor and major epileptic fits, tremor, muscular weakness, symptoms resembling disseminated sclerosis, acute encephalitis in cases of hyperinfestation, and sensory, psychical, or mental symptoms of great variety and long duration, and the prognosis is very uncertain. In treatment luminal and bromide are helpful in controlling the fits, but any attempt to kill the parasites may precipitate epilepsy, and operations are useless on account of the number of the cysts.

REFERENCE.—*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, Jan. 31, 343.

CYSTS AND FISTULÆ. (*See also HANDS AND FINGERS, SURGICAL AFFECTIONS OF.*) *Sir W. I. de C. Wheeler, F.R.C.S.I.*

The Use of Sclerosing Solutions in the Treatment of Cysts and Fistulæ.—The success which has attended the treatment of varicose veins and piles by the injection method of treatment has led to the trial of these injections further afield. For example, varicocele can be cured after one injection, although the reaction is often intense. The method employed is referred to in the *MEDICAL ANNUAL* for 1933 (p. 475) and for 1932 (p. 252). The treatment of bursæ by injection is established. It is well known that in a number of cases hernia can be cured by this method. Half a century ago the method of election for the treatment of hydrocele was the injection of irritating fluid; port wine was commonly used.

E. C. Cutler and R. Zollinger¹ have had encouraging results in the treatment of cysts and fistulæ. They adopt the injection method in the case of gliomatous cysts, cervical fistulæ, and pilonidal sinuses. In the last two conditions they had unexpected success. In one case of cervical fistula a small fistulous opening was found an inch above the insertion of the attachment of the right sternomastoid muscle into the clavicle. Methylene blue injected through the opening was immediately expectorated by the patient. An opening in the mid-portion of the right posterior tonsillar pillar was found. Lipiodol was injected and it showed a sac and small track leading up into the pharynx. The sinus track was irrigated with Zenker's fluid, the opening in the pharynx being protected. This produced considerable pain, but subsequently the fistulous opening remained entirely healed.

The method of treatment adopted for infected pilonidal sinus is also described. The sinus track was opened after infiltration with novocain. The cavity was packed with vaseline gauze. Three days later the edges of the wound were covered with zinc oxide and the cavity was filled for ten minutes with a modified Carnoy's solution (mentioned below). About a week later the cavity was again treated with the solution for eight minutes and then packed with iodoform gauze. In a month the wound was completely healed.

In another case an injection was made into the sinus with 10 c.c. of the solution. The solution was held in position for about ten minutes. The process was repeated the following day and twice during the next two weeks. The destroyed tissue was frequently curetted away and a drain was inserted. Several further applications were made, but the patient did not lose a day from

PLATE XVI
BRANCHIAL FISTULAE
(HAMILTON BAILEY)



Fig. 1.— A branchial fistula of over thirty years' duration. *Inset:* X-ray after injecting the fistula with lipiodol.

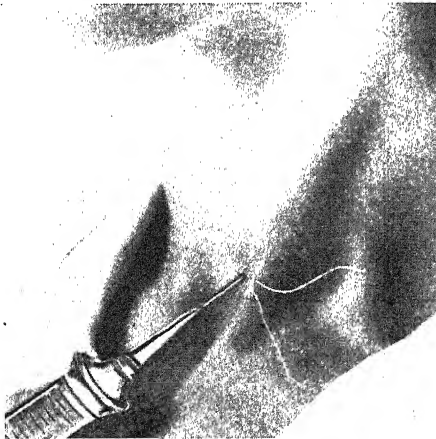


Fig. 2.— Method of injecting a cervical fistula with lipiodol. A subcutaneous purse-string suture has been inserted and a lachrymal-duct syringe is being employed.

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PLATE XVII—BRANCHIAL FISTULAE—continued

(HAMILTON BAILEY)

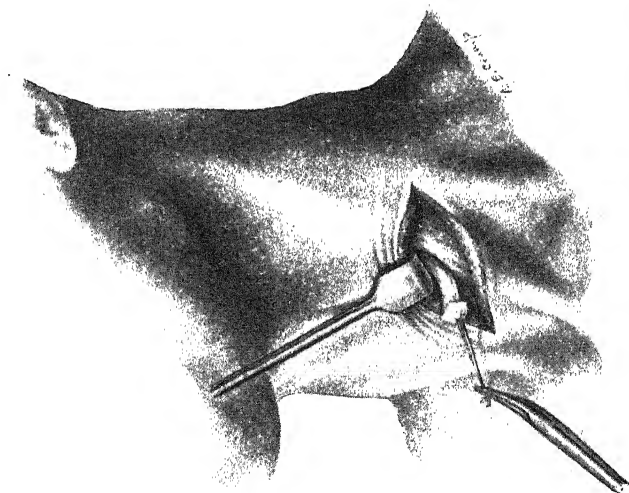


Fig. A.—The step-ladder method of excising a branchial fistula.
Stage 1.

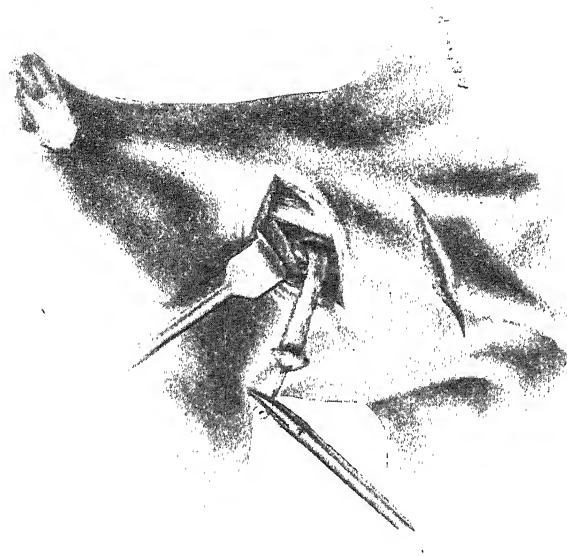


Fig. B.—The step-ladder method of excising a branchial fistula.
Stage 2.

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work and the sinus eventually and entirely healed. The modified Carnoy's solution advocated by Cutler and Zollinger is made up as follows :—

R	Absolute Alcohol	..	..	6 c.c.
	Chloroform	..	..	3 c.c.
	Glacial Acetic Acid	..	..	1 c.c.
	Ferric Chloride	..	..	1 grm.

Branchial Fistulae.—Hamilton Bailey² gives an excellent account of the clinical aspects of these congenital defects (*Plates XVI, XVII*). Branchial fistulae are of three different types: (1) Complete with an outer and inner opening; (2) Incomplete external fistula, with an outer opening only; (3) Incomplete internal fistula, with an inner opening only. The commonest variety is blind internally.

The External Opening.—In fully 80 per cent the external orifice is situated in the lower third of the neck. The branchial cyst, on the other hand, is situated in the upper third of the neck. The fistula is present at birth, the cyst appears in early adult life. In a small proportion of cases it will be found that the external orifice is situated midway along the anterior border of the sternomastoid.

The Internal Orifice.—The internal orifice is distinctly uncommon and is usually situated in the region of the tonsil.

SYMPTOMS.—Apart from the continual or intermittent discharge of mucus, the leading symptoms are due to inflammation of the fistula. Sometimes the vagus is in direct relation to the fistula; thus manipulation of the fistulae may produce a cough, palpation, and intermittent pulse. To ascertain the extent of the fistula there is no better method than a lipiodol injection. The injection may be made through a ureteric catheter or a lachrymal duct syringe. If the lipiodol is too viscid to go through the fine nozzle, it may be diluted with an equal volume of liquid paraffin. The illustration (*Plate XVI, B*) shows a purse-string suture in position. This is tightened at the completion of injection to prevent regurgitation of the opaque medium. Hamilton Bailey suggests that the extirpation of these fistulous tracts may be facilitated by a special form of 'step-ladder' operation. The method of pulling the tract through a second higher incision after mobilization is shown in *Plate XVII*.

Cysts and Sinuses of the Sacrococcygeal Region.—Complaints have recently appeared that this subject is not dealt with in the majority of surgical text-books. It has been repeatedly referred to in the *MEDICAL ANNUAL* (1933, p. 349, and 1934, pp. 130, 139, and 353).

T. H. Thomason³ states that the sacrococcygeal region is perhaps the most common site in the body for anomalous cysts and sinuses and tumours of developmental origin. A formidable problem is presented by those cysts and tumours which lie in front of the sacrum and coccyx. "The confusion of the amateur pathologist who attempts their study is only exceeded by the confusion of the amateur operator who attempts their removal."

The pathology of pilonidal sinus is simple. From a small orifice (post-anal dimple) it extends backwards from the anus towards the sacral hiatus as an indurated infected tract. It may extend laterally under the skin of the buttock for several inches. The symptoms are those of recurrent abscess formation. The condition must not be confused with anal fistula or simple pyogenic abscess.

REFERENCES.—¹*Amer. Jour. Surg.* 1933, March, 411; ²*Brit. Jour. Surg.* 1933, xxi, Oct., 173; ³*Ann. of Surg.* 1934, April, 585.

DEAFNESS (See EAR, AFFECTIONS OF.)

DEFORMITY, CONGENITAL, DUE TO LESIONS OF STRIATED MUSCLE.*John Fraser, Ch.M., F.R.C.S.Ed.*

Much has been written about the origin of congenital deformities of the limbs, and in the past the theory of uterine pressure has been that most favoured. More recently there has been increasing criticism of this explanation, and, when one comes to think of it, there has never been any real experimental or clinical evidence in support of it; it has been at the best but a hypothesis. D. S. Middleton¹ presents what would seem to afford a very reasonable explanation of the problem; it is that a prenatal disturbance of muscle is the primary derangement, and that secondary to the soft tissue error there are various structural adaptations of the bones. This view was put forward many years ago by Griffiths in relation to the deformity of claw-foot, but he apparently took no step to substantiate his theory. Middleton discusses the errors of congenital tibial kyphosis, congenital high shoulder (Sprengel's shoulder), and myodystrophia foetalis deformans (arthrogryposis multiplex congenita). Each of these he attributes to prenatal errors of the muscle, with the result that growth is interfered with and movement restricted, subsequent to which the disproportion between growth of muscular tissue and bones leads to either a local deformity of the latter or a more general body disturbance.

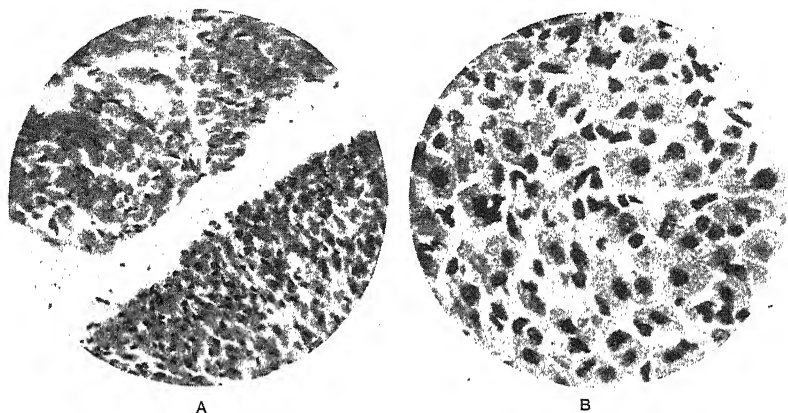


Fig. 12.—A, Fully differentiated muscle fibres in the upper part of the field and myoblastic tissue in the lower part ($\times 280$); B, The appearance of the myoblastic cells under a high power ($\times 650$).

(By kind permission of the 'Edinburgh Medical Journal'.)

He has investigated the condition of the affected muscles by biopsy and by dissection, and, though the results have not been universal, he has found evidence that in many instances the parts are affected by what he terms a 'myoblastosis'—that is, a condition in which the muscular tissue shows the presence of numbers of undeveloped myoblastic cells (*Fig. 12*), a state of affairs which normally should terminate at the third month. In many instances the muscle remains in the myoblastic condition, in others the disturbance may pass on to fibrosis, to ossification, or to a widespread fatty degeneration.

In the various conditions described different muscular groups are involved—in congenital tibial kyphosis it is the sural group; in congenital high shoulder the trapezius, the levator anguli scapulae, and the rhomboids; in myodystrophia foetalis deformans the muscles of the extremities and, it may be, of the trunk and the diaphragm.

The explanation of the muscular error is obscure. Examination of the central nervous system and peripheral nerves has yielded negative results, so that there is reason to assume that the disturbance is inherent in the muscle, and probably related to an error in development.

REFERENCE.—¹*Edin. Med. Jour.* 1934, xli, 401.

DEMENTIA PRÆCOX. (See SCHIZOPHRENIA.)

DERMATITIS MEDICAMENTOSA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Orthoform.—P. C. P. Ingram¹ records a case of an eruption following the application of 10 per cent orthoform ointment to septic ulcers of the foot. Five days after commencement of the treatment itching of the face and oedema of the eyelids was noticed. The patient appeared distinctly ill, was drowsy, had profuse salivation, and a temperature of 101°. His face and neck were almost covered with elevated erythematous patches, but, except for a few less distinct though similar lesions on the upper part of his chest and back, the rest of the body was clear. His urine contained traces of albumin and sugar. The rash and other symptoms had all disappeared in a week, under appropriate treatment.

Sodium Isoamylethylbarbiturate (Sodium Amytal).—A. M. Langebach² describes four cases in which an eruption appeared after taking sodium amytal. The eruptions were distributed chiefly on the face, neck, arms, hands, and mucous membranes of the lips and mouth. The lesions were bright rose macules sparsely distributed on the limbs, but more closely on the face. They did not itch. The lesions on the mucous membranes were of the same character but more indurated than those on the skin. The rash disappeared in a few days when the drug was stopped. In three of the four cases an identical eruption was produced when the drug was taken on a subsequent occasion. It is interesting to note that none of the cases showed any sensitiveness to the drug when first administered; this developed from eight to fourteen months after the drug had been taken and then discontinued.

REFERENCES.—¹*Brit. Jour. Dermatol. and Syph.* 1933, Dec., 526; ²*Jour. Amer. Med. Assoc.* 1934, April 28, 1376.

DERMATITIS VENENATA. *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

Butesin Picrate.—M. B. Sulzberger and F. Wise¹ describe four cases in which eruptions followed the use of butesin picrate ointment, and have made some interesting observations on them. In two cases it could be shown that clinical evidence of sensitization developed in from one week to thirteen days after use of the medicament was discontinued. This period corresponds to that observed in sensitizations to serums, etc. The authors were able to distinguish three phases in sensitizations of an eczematous nature: (1) A period of refractoriness to sensitization, during which the patient's skin does not become sensitized, in spite of intimate contact with a substance which may at some later time, and for some unknown reason, suddenly cause a sensitization. The length of this period varies from days to years. (2) A period of incubation of sensitization which is the time for sensitization to develop in a patient coming in contact with a sensitizing agent during a state of susceptibility to sensitization. In the cases the authors have observed this seems to be relatively constant from one to two weeks. (3) A period of development of clinically manifest reaction, which is the time elapsing between contact with the excitant and the appearance of the clinical reaction in an already hypersensitive patient. This period varies from hours to days (usually

being from sixteen to forty-eight hours) and seems constant in a given patient with a given excitant.

In two cases patch tests showed the patients were hypersensitive to both butesin and picric acid; in a third case the patient was hypersensitive to butesin, but not to picric acid. The authors find that butesin and picric acid have each a characteristic reaction. Butesin causes a persistent follicular eruption and deep œdema with little redness, while picric acid produces, on the other hand, diffuse severe erythema, little œdema, and many minute non-follicular vesicles.

Almonds.—J. C. Bridge,² in an exhaustive paper on occupational diseases of the skin, states that he has recently seen the occurrence of dermatitis among girls employed in bleaching almonds. In this process the nuts were soaked, and all the girls had to do was to pick out the skins from the almonds and remove any adherent skin from the nuts, which was easily done between the finger and thumb. Nevertheless, a certain number of them developed dermatitis, commencing at the wrist, and at first sight the obvious cause seemed to be the essential oil. On inquiry it was found that those who developed the conditions were those who wore long sleeves. It appeared that the primary cause was friction by the edge of the garment at the wrist; the essential oil subsequently, no doubt, played its part.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1933, Oct., 461; ²*Brit. Med. Jour.* 1933, Aug. 19, 324.

DIABETES MELLITUS.

(*Sir Walter Langdon-Brown, M.D., F.R.C.P.*)

Carbohydrate Metabolism.—J. J. R. Macleod¹ reviewed the whole question of the control of carbohydrate metabolism in the Herter Lectures. He has experimentally confirmed in animals the fact that after fasting the percentage of blood-sugar is decidedly higher in those not fed on carbohydrate than in those richly fed, but that the glycogen content of the liver was higher in those given carbohydrate. Animals deprived of carbohydrate are more susceptible to insulin, and he suggests that the recalcitrance of certain patients to insulin may have something to do with their former diet. Repeating Claud Bernard's classical experiments on diabetic puncture very accurately, he concluded that the so-called diabetic centre is in the anterior portion of the pons. He does not regard the effect of this puncture as exerted through the adrenals since decerebration hyperglycæmia will develop after removal of these glands. But he does regard their presence as important for maintaining the excitability of the sympathetic pathway, and considers that impulses controlling the discharge of sugar by the liver travel by the hepatic nerves. The control of the mechanism of sugar production by the vagus differs from that of the sympathetic in this way: the former acts on a process by which sugar is produced *de novo* in the liver, the latter on the rate of breakdown in the glycogen already stored there.

He sums up the position as follows: the diabetogenic centre, acting through the parasympathetic pathway, stimulates the secretion of sugar by the liver, perhaps by controlling the secretion of glycogen. When this centre is stimulated the secretion of insulin is inhibited, but this cannot occur if the parasympathetic pathway is blocked by atropine, by amytal, or by section of the vagi. At the same time that these inhibitory stimuli are passing along the parasympathetic, stimulating ones are passing via the splanchnics to the liver causing glycogenolysis, adrenal stimulation perhaps assisting in the process. These two processes converge in that by inhibiting the secretion of insulin and increasing the secretion of sugar by the liver, they both tend to produce hyperglycæmia.

Fat Metabolism and Diabetes.—E. P. Joslin,² in a very interesting paper on fat metabolism and diabetes, states that whereas in the past an excess of fat caused diabetes to die from acidosis, now it leads them to die of arteriosclerosis. He is convinced of the importance of avoiding obesity in the diabetically predisposed individual. Clearly the efficiency of the pancreas may be overstrained by a fat diet as well as by excess of carbohydrates, since we know that a fat diet may lead to a blood-sugar curve almost typical of diabetes. We must also remember that endogenous fat will behave in this respect just like the exogenous. Therefore a person losing weight rapidly will give a similar curve. In another respect, however, there is a difference, for inanition causes fat to be deposited more extensively in the liver than does a fatty diet. Is the stage of obesity antecedent to diabetes the result of over-eating, which has led to overproduction of insulin to maintain a normal blood-sugar, and thus to rapid storage of carbohydrate in the tissues where it is converted into fat?

Laboratory work has recently thrown fresh light on the metabolism of fat. A depancreatized dog usually dies in one to two weeks unless he receives insulin. But even then he dies in less than a year with signs of failure of liver function. It has been known for some years that this can be prevented if raw pancreas is given with the insulin. Hershey thought that the substitution of lecithin for raw pancreas was even more effective. Apparently lecithin plays an important part in the transport of fat from the tissue depôts to the liver and in their desaturation there, preliminary to combustion. It was then found that it was the choline fraction of the lecithin that acted thus. But choline is toxic, and so the Canadian workers in Best's laboratory went on and found that betaine, a non-toxic oxidation product of choline, would act just as well.

The control of fat metabolism is of great importance because the amount of cholesterol in the blood seems to play such a large part in development of complications in diabetes. Coma and a high blood-fat usually go together. Xanthoma is directly related to an excess of blood-cholesterol. With cataract and arteriosclerosis this association is suspected but not proved.

The history of the rôle of fat in the diabetic diet may be summarized thus :—

1. *The Naumyn Era* (1898–1914).—Fat was practically unlimited in the diet, and carbohydrate was kept extraordinarily low, with the result that 60 per cent of the patients died of diabetic coma. Nevertheless, some of the remainder did well, so that the average expectation of life for the diabetic was higher than before.

2. *The Allen Era* (1914–22), with reduction in the total calories, but carbohydrate low and fat still high. With this simple but fundamental expedient, coma as a cause of death fell to 40 per cent, and in well-regulated hospitals seldom developed *de novo*. Again the average expectation of life rose.

3. *The Banting and Best Era* (1922–34), when insulin enabled the allowance of carbohydrate to be increased as well as the total quantity of food while the proportion of fat has been lowered.

Rhythm in Metabolism.—J. Möllerstrom³ maintains that there is a periodic variation in the effect of nourishment on the blood- and urine-sugar curves which is different in different individuals and may change slightly in the same individual from day to day. He explains it in the light of Forsgren's discovery of the rhythmic functioning of the liver; when this is in the assimilatory stage there is a tendency to carbohydrate retention; in the catabolic stage this is reversed. Insulin should be given with due regard for this endogenous rhythm.

Types of Diabetes.—R. M. Murray Lyon,⁴ from an analysis of 1700 cases, arrives at the following classifications :—

1. *Obese*: marked preponderance of women; mostly in the fifth and sixth decades; high incidence of 'neuritic' pains; loss of weight is not marked.

2. *Arteriosclerotic*: mostly over the age of 60; mild type of diabetes overshadowed by degenerative changes, chiefly in the circulatory system.

3. *'Tonic'*: younger; more males than females: severe and more acute in onset; more often associated with sepsis.

Inheritance was found in 16.3 per cent, there being no significant difference between the three classes in this respect: 22.4 cases of non-diabetic glycosuria showed a male preponderance and earlier incidence; 32.6 per cent were symptomless, as compared with only 2 per cent of the patients who had true diabetes. An important fact elicited was that 31.7 per cent of symptomless glycosurias proved to be true diabetes.

Complications.—

1. *Tuberculosis*.—H. F. Root⁵ has made an exhaustive inquiry into the vexed question of the association of diabetes with tuberculosis. He found that active tuberculosis occurred in diabetics between two and three times as often as might have been expected from the frequency of the two diseases, even were they not associated. In children the ratio was much higher, while among adolescent diabetics, pulmonary tuberculosis occurred sixteen times as frequently as among non-diabetics of the same age. Post-mortem examination showed that such tuberculosis was not invariably progressive, while miliary, meningitic, and acute generalized tuberculosis were rarely found. Root considers that the primary infection occurred early in life, and that the diabetes subsequently lowered the resistance of the patient. The recognition of pulmonary tuberculosis in a truly incipient stage in a diabetic is almost unknown in the literature. Clinically a marked gain in carbohydrate tolerance during advancing tuberculosis was noted in a few cases, and the reviewer has observed this several times. Early use of insulin is essential in raising resistance to tuberculosis, but hypoglycæmia must be carefully avoided in ill and emaciated patients. The author thinks that the modern prolongation of life of the diabetic and his greater activity expose him to more liability to develop tubercle, and may thereby result in an actually greater incidence of this disease in diabetics.

2. *Arteriosclerosis*.—W. K. Jordan and P. Walters,⁶ analysing 70 cases of cerebral vascular accidents in diabetes, find, as might be expected, that arteriosclerosis and hypertension are the most important etiological factors, but that diabetics stand such accidents rather better than non-diabetics. The reason for this is not obvious.

3. *Septic Complications*.—P. P. Vinson and R. M. Wilder⁷ call attention to a complication of diabetes not hitherto described—diffuse ulceration of the œsophagus and trachea.

H. C. Hesseltine⁸ confirms the old but often forgotten observation of Lawson Tait's, that the vulvo-vaginitis of diabetes is due to an infection, usually a mycosis, which yields to a fungicidal therapy.

4. *Glandular Complications*.—H. J. John⁹ describes four cases of Mikulicz's disease in obese subjects suffering from mild diabetes. He quotes Charvat and Flamm, who, in describing similar cases, suggested that the parotid swelling represents a compensatory process for decreased pancreatic function. The idea is interesting, when one recalls the sympathetic pancreatitis which may accompany the parotitis of mumps.

F. Introna¹⁰ believes that ketosis is particularly liable to occur when the thyroid or pituitary is involved. He maintains that after irradiation of these glands a smaller dose of insulin is required, thereby providing another point in favour of a polyglandular origin for diabetes.

5. *Coma*.—O. Röncke¹¹ strongly advocates intravenous insulin for diabetic coma, and claims that the Oslo statistics show a marked improvement in the results since large doses have been given in this way.

H. Lande¹² calls attention to the two factors of shock and hyperpyrexia as important in the mechanism of fatal diabetic coma.

(See also HEART DISEASE; HYPOGLYCAEMIA AND HYPERINSULINISM.)

Diabetes and Pregnancy.—E. Skipper,¹³ from a study of diabetes and pregnancy, concludes that while insulin has considerably lowered maternal mortality, it has led to no reduction of foetal mortality. It has a favourable influence upon the fertility of diabetics, and with adequate treatment pregnancy is not harmful to them. There is usually a fall in carbohydrate tolerance in the latter half of gestation and a rise frequently occurs after childbirth, so that hypoglycaemic crises must be carefully guarded against. Lactation does not appear to be the chief cause of this hypoglycaemia, and breast-feeding is not deleterious. The most important cause of foetal death is poor control of the maternal disease. Hydramnios is an occasional source of danger to the child. No evidence of congenital diabetes has been found.

Diabetes in Childhood.—E. Downie¹⁴ attributes the occasional local occurrence of lipodystrophy to the prolonged use of any one area for insulin injection, and advises varying the site of injection at fairly frequent intervals. In coma the simplest and best indication for the cessation of intensive insulin therapy is the decrease in air-hunger. He calls attention to the early occurrence of arteriosclerosis even in children if they are not kept stabilized.

H. Medovy¹⁵ stresses the view that a normal diet should be the constant, and insulin the variable, factor in the treatment of the diabetic child.

Operations on Diabetics.—E. P. Ralli and S. Standard,¹⁶ in supporting the modern contention that in these days of insulin treatment the diabetic need not be denied surgery because of his diabetes, record the interesting, though rather disturbing, fact that in 35 per cent of their cases the diagnosis of diabetes was made for the first time when the patient was admitted to the surgical wards. In the aged diabetic, death following operation was not primarily due to a disturbed carbohydrate metabolism, but rather to the diffuse arteriosclerosis. Only in the severe infections is the treated surgical diabetic liable to die of his diabetes. This reinforces the generally accepted view that sepsis greatly limits the response to insulin.

Symptomless Glycosuria.—P. J. Cammidge,¹⁷ from a study of 420 cases in which sugar was discovered in the urine either in an examination for life insurance or in the course of a routine test of the urine for other purposes, comes to the following conclusions: (1) The prognosis in symptomless glycosuria is usually good; (2) Most patients live for many years after the onset of the glycosuria, although limitation of the diet, and eventually insulin, may be necessary in some; (3) Death is generally due to some intercurrent condition, but complications, such as septic infection, pregnancy, and surgical operations are liable to increase the metabolic disturbance, and may bring about a fatal termination; (4) Patients with a recessive (familial) history are more likely to develop a severe glycosuria, and require the use of insulin, than those with a dominant (direct) family history, which is the most common type.

G. Pincus and P. White,¹⁸ from an analysis of 675 family histories, agree with the hypothesis that potentiality for developing diabetes is inherited as a simple Mendelian recessive.

Pseudo-glycosuria.—Cammidge¹⁷ found that out of 200 cases, in 60 the sugar was levulose and in 67 iso-glycronic acid, 30 were cases of pentosuria, 16 passed lactose and were all either pregnant or lactating; in 16 the reducing

action was due to an excess of glycuronic acid; one patient, a middle-aged man, who was consuming very large quantities of milk, passed galactose; and another, who was a heavy beer-drinker, excreted maltose. This indicates, among other things, that pentosuria is not so rare as was thought, and the same conclusion may be deduced from the report of 12 cases by M. Englewitz and M. Lasker.¹⁹ In every case the pentose was l-xyloketose, which reduces alkaline copper solutions in the cold and gives a positive test with Bial's reagent. Headache and neurasthenia were common symptoms.

PROGNOSIS.—E. P. Joslin, L. I. Dublin, and H. H. Marles²⁰ by elaborate statistical studies support the view that diabetes as a cause of death has been rapidly growing in importance during the present century all over the world. It is now one of the leading causes of death in the United States, where the mortality per 100,000 is 22.0 compared with 14.5 in England and only 12.8 in Canada. The increase is most marked in later life, and curiously enough almost entirely affects females. In England it is only since the introduction of insulin that the death-rate in females has exceeded that of males, and it is confined to women over 35. The death-rate among males has been relatively stable. In childhood and early adult life, on the other hand, there has been a distinct improvement in the death-rate for both sexes.

This should give us pause in accepting too readily the relaxations of diet which insulin renders possible. It is significant that the death-rate has increased not among those in whom the disease is usually most severe, but among those who are often responsible for conducting their own treatment. G. J. Drolet,²¹ from statistical tables, supports Joslin's contentions.

B. Jablons²² also points out that in spite of insulin the mortality rate of diabetes is increasing, which shows that not only is the disease more prevalent but that insulin is not being administered with sufficient intelligence. He urges the importance of sterilizing the insulin syringe in solutions entirely free from alkali. Sodium bicarbonate in a dilution of 1-2500 will completely destroy insulin. In urging the importance of very large quantities of fluid to wash out diacetic acid and acetone from the system, he quotes unpublished observations of Wagner showing that these substances form dangerous compounds with the nervous tissues in the heart, thereby contributing to the fatal effects of coma.

There is, however, a possible fallacy in this alleged increase in the mortality rate, for, as H. O. Mosenthal and C. Bolduen²³ point out, many diabetics now die of the same diseases as persons not afflicted with diabetes, yet are still registered as deaths from diabetes. They therefore believe that the rising incidence of diabetes, at any rate in New York City, is more apparent than real. But as diabetics are now more able to become parents, the hereditary factor will probably bulk more largely in the future. They agree that diabetics should not die of diabetes now, and think that this can only be prevented by improved and increased organization of diabetic clinics.

TREATMENT.—J. A. Nixon,²⁴ one of the first advocates of a higher carbohydrate diet for diabetics, believes that before long they will be dieted just like anybody else. They will eat the ordinary foods of the family, but the quantities must be more exactly measured. They will not be asked to eat enormous portions of fat, and they will be permitted the same proportions of carbohydrate as are regarded as physiologically reasonable for the healthy. They will not eat bread substitutes, nor be compelled to eat wholemeal bread unless they like it, and they will not have to take uncomfortable amounts of cellulose. It need hardly be added that such a régime is only possible when adequately controlled by insulin.

J. Eamon and D. M. Lyon,²⁵ while agreeing after a careful inquiry with the modern view of allowing the diabetic a greater variety in his diet, favour an intermediate plan, involving rather more fat and not quite so much carbohydrate. They adopt a ratio FA/G = 1.0 : 1.2, where FA = total fatty acid obtainable from the protein and fat of the diet, and G the total glucose obtainable from the protein and carbohydrate.

P. A. Gray and W. D. Sansum,²⁶ in supporting the value of the higher carbohydrate diet from an analysis of over 1000 cases, report an improved sugar tolerance, as measured by either an increased diet or a reduced insulin dosage, in 42 out of 70 cases in which this diet had been used for seven years continuously.

O. Leyton,²⁷ in an article under the challenging title, "Does insulin cure diabetes?" replies to his own question, "Yes, if given in adequate dose and if the patient can be protected from adverse influences." He gives the following reasons why it may fail:—

1. Inadequate dosage. He draws a comparison with subacute combined degeneration, where massive doses lead to amelioration, while doses which suffice in Addison's anaemia prove inadequate.

2. Insulin is hampered by the patient taking substances which stimulate the cell-islets to secrete and thus lead to their further exhaustion, the most important of these being alcohol. T. C. Hunt has pointed out that the fall of blood-sugar produced by alcohol is possibly due to direct stimulation of the pancreas, which is harmful to the diabetic.

3. Insulin is hampered by the toxins of viruses or microbes. Even a common cold calls for a bigger dose. The removal of septic teeth may lead to a great increase in the power of carbohydrate storage, whilst the results of tonsillectomy have been most disappointing.

4. A patient who has had an acute attack of diabetes mellitus is not protected from further attacks.

Leyton gives a list of 20 patients who have been able to dispense with insulin, all of whom initially had a resting hyperglycaemia; 3 of them relapsed, owing to severe infection or a return to alcohol; only 4 have been free from insulin for about seven years.

R. D. Lawrence and R. A. McCance²⁸ report that *sionin*, which is closely related chemically to sugar, may be safely used as a sweetening agent for diabetics as it does not enter closely into carbohydrate metabolism. But its price makes it simpler to give ordinary sugar and slightly more insulin.

Insulin Therapy for Non-diabetic Conditions.—H. Blotner,²⁹ in advocating the use of insulin for *loss of weight*, calls attention to the improved appetite and digestive and assimilative capacity which result. This is reflected in an improved protein concentration in the plasma and in the whole blood picture.

REFERENCES.—¹*Bull. Johns Hopkins Hosp.* 1934, 79; ²*New Eng. Jour. Med.* 1933, Sept. 14, 519; ³*Arch. of Internal Med.* 1933, Nov., 649; ⁴*Edin. Med. Jour.* 1933, June, 293; ⁵*New Eng. Jour. Med.* 1934, Jan., 1, 78, 127, 192; ⁶*Amer. Jour. Med. Sci.* 1933, Oct., 488; ⁷*Arch. of Internal Med.* 1933, Oct., 541; ⁸*Jour. Amer. Med. Assoc.* 1933, Jan. 21, 177; ⁹*Ibid.* July 15, 184; ¹⁰*Polliclinico*, 1933, Sept. 4, 1401; ¹¹*Brit. Med. Jour.* 1933, ii, Aug. 12, 27; ¹²*Jour. Amer. Med. Assoc.* 1933, July 1, 9; ¹³*Quart. Jour. Med.* 1933, July, 353; ¹⁴*Med. Jour. of Australia*, 1933, Sept. 16, 367; ¹⁵*Canad. Med. Assoc. Jour.* 1933, Dec., 605; ¹⁶*Surg. Gynecol. and Obst.* 1934, Feb., 228; ¹⁷*Brit. Med. Jour.* 1933, ii, Dec. 30, 1208; ¹⁸*Amer. Jour. Med. Sci.* 1933, July, 1; ¹⁹*Ibid.* Oct., 539; ²⁰*Ibid.* Dec., 753; ²¹*Jour. Amer. Med. Assoc.* 1933, March 11, 733; ²²*Med. Jour. and Record*, 1933, Aug. 16, 112; ²³*Amer. Jour. Med. Sci.* 1933, Nov., 605; ²⁴*Practitioner*, 1934, Jan., 25; ²⁵*Lancet*, 1933, i, April 8, 743; ²⁶*Jour. Amer. Med. Assoc.* 1933, May 20, 1580; ²⁷*Lancet*, 1933, ii, July 15, 120; ²⁸*Ibid.* Dec. 2, 1257; ²⁹*Jour. Amer. Med. Assoc.* 1933, Jan. 14, 88.

DIETETICS. (*See also* VITAMINS.)

Ivor J. Davies, M.D., F.R.C.P.

Food Values and their Practical Application.—Professor J. A. Nixon¹ (Bristol) has written a useful article on this subject. The original paper is easily available to practitioners and is well worth close attention. It presents the physiological knowledge essential to the planning of dietaries in a most simple and interesting manner.

Use and Misuse of Carbohydrates.—H. H. Paton² (Edinburgh), in a contribution on this subject, suggests that improvement in the quality and reduction in the quantity of our carbohydrate intake would produce beneficial effects upon the public health, and that this improvement can best be effected, in the first place, by reform in the methods of milling applied to our cereal foodstuffs, and, in the second place, by restriction in the use of sugar. He is confident that the high rate of sugar consumption in modern diet is a factor of importance in prolonging and aggravating catarrhal illness. He refers to the work of H. C. Cameron,³ who held that children of the catarrhal diathesis show visible and permanent improvement when carbohydrate food is restricted. In such children he describes a state of body in which water retention is evident, and to this fact he attributes their tendency to suffer from "a variety of chronic catarrhal and exudative processes".

J. Eason⁴ states that experimental observations on the effects of deficiency diets show that an increasing number of disorders, for which hitherto there has been no adequate conservative treatment, may be prevented, mitigated, or abolished. These same disorders affect countless numbers of patients who crowd general and special departments of hospitals. He suggests that the incidence of enlarged tonsils and adenoids may so frequently coincide with dietetic faults as to indicate that these disorders are in large measure due to nutritional defects. Paton² finds that improvement in chronic tonsillar hypertrophy and chronic nasal catarrh occurred after sugar in every shape and form was withdrawn, whilst Eason³ maintains that if a well-balanced diet containing sufficient vitamins, minerals, and proteins is given, the catarrhal states clear up quickly. In order to effect this, the sugar or the fat formerly taken may require to be reduced, more often the sugar, but drastic restriction of sugar is unnecessary and may occasionally be unwise.

The reports of this meeting of the Medico-Chirurgical Society of Edinburgh should be carefully studied.

Insulin in Nutritional Disorders.—C. W. Lueders⁵ (Philadelphia) submits a follow-up report of 35 patients on insulin therapy in certain disorders of nutrition. The injection of insulin once or twice daily to the average total of 40 units daily produced, with but few exceptions, a striking gain in weight and general well-being. A restoration to normal of motor and secretory function of the digestive tract was especially noted and maintained when insulin was discontinued.

Absorption of Dextrose per Rectum.—W. S. Collens and L. C. Boas⁶ (Brooklyn) investigated the absorption of dextrose by rectum in an unselected series of diabetic and non-diabetic patients. They conclude that dextrose is absorbed when it is administered by rectum. Although dextrose does not pass through the membrane of the colon as rapidly as through the small intestine, a sufficient amount is absorbed to warrant recognition of this method as an acceptable therapeutic procedure.

REFERENCES.—¹*Brit. Med. Jour.* 1934, i, 1; ²*Edin. Med. Jour.* 1933, Oct., 177; ³*Diseases of Children*, 1926, Chap. ix; ⁴*Edin. Med. Jour.* 1933, Oct., 191; ⁵*Med. Jour. and Record*, 1933, Aug. 16, 118; ⁶*Arch. of Internal Med.* 1933, Aug., 317.

DINITROPHENOL POISONING. (*See* OBESITY; POISONING.)

DIPHTHERIA.*J. D. Rolleston, M.D., F.R.C.P.*

EPIDEMIOLOGY.—According to the Report of the Health Section of the League of Nations,¹ in most European and non-European countries the incidence of diphtheria was on the increase from 1926 to 1930. On the other hand, the diphtheria mortality during the period 1923 to 1933 showed a significant decline as compared with the last decennium of the nineteenth century and beginning of the twentieth except in Central and Eastern Europe. Only a fraction of this decline is due to a fall in the birth-rate. In most of the countries of Western Europe, the United States, Canada, Australia, and New Zealand, the diphtheria case fatality rate appears to have reached a fairly low and steady level, but in Central and Eastern Europe it is still fairly high and relatively unstable. The campaign during the last ten years in favour of active immunization does not seem to have yet affected a sufficiently large proportion of the children or total population of the various countries for their results to be shown on the curves of mortality or morbidity.

BACTERIOLOGY.—H. M. Leete, J. W. McLeod, and A. C. Morrison² state that diphtheria in Hull has been particularly severe during the last three years. In a series of 310 cases of all grades of severity 59 showed the gravis strain of diphtheria bacillus previously described by Anderson and others (*see* MEDICAL ANNUAL, 1934, p. 152). Of the 40 toxic deaths in the series, 35 were due to the gravis and 5 to intermediate strains. The striking feature in the gravis infections in a completely non-immune subject was the extremely rapid course of the toxæmia. The intermediate type, which was found in toxic and fatal cases but to a less extent than the gravis strain, was intermediate in clinical severity.

ETIOLOGY.—The experiments of W. G. Savage published in 1920 (*see* MEDICAL ANNUAL, 1922, p. 104) appeared to settle finally in the negative the question whether cats could contract or disseminate diphtheria. E. Bruce Brooks,³ however, has recently carried out the following experiments which partly contradict and partly confirm those of Savage. The Schick test was performed on 70 cats and kittens with negative results. Injections of standardized toxin, however, caused death of the animals, the minimum lethal dose being five times as great as that for guinea-pigs. Injections of antitoxin protected the animals which had had toxin. The pharyngeal mucous membranes of cats and kittens were inoculated with cultures of virulent diphtheria bacilli which were still present at the end of twenty-four hours but disappeared in forty-eight hours. When, however, the cultures of diphtheria bacilli were mixed with Vincent's organisms, the duration of the diphtheria bacilli on the scarified mucosa was as long as four days. Diphtheria bacilli inoculated in the nasal cavities and trachea remained in these situations for not more than five days. Lastly, diphtheria bacilli suspended in normal saline were applied to the fur of cats in various parts of their body, but in no instance were the bacilli found to live more than three days. Brooks comes to the conclusion that while cats and kittens are not susceptible to diphtheria they may act as carriers of the disease from one to four days after exposure through contamination of the rhinopharynx or fur.

SYMPTOMS AND COMPLICATIONS.—B. Schirwindt⁴ records his observations on 205 cases of *toxic diphtheria* in children. Nasal involvement was frequent, its highest incidence (80 per cent) being found in hæmorrhagic diphtheria. On the other hand, involvement of the larynx and the lower respiratory tract was much less common. The most frequent complication was renal involvement, which occurred in 67.4 per cent, and the most serious one myocarditis, which was present in 20 per cent, and was fatal in 77.5 per cent. Estimation of the blood-pressure, as shown by the reviewer many years ago (*see* MEDICAL ANNUAL,

1912, p. 229), was of no essential diagnostic or prognostic importance. Paralysis developed in 24.4 per cent, its most frequent time of onset being the end of the second week. The fatality rate of the toxic cases was 21.6 per cent. Death usually took place in the first three weeks and most frequently in the second week. Only a small proportion of the cases were admitted before the third day of disease.

H. Aleurent⁵ states that *primary ocular diphtheria*, though much less frequent than the faucial variety, is not a clinical rarity during an epidemic, though it may require laboratory assistance for its detection. It is most frequently unilateral. It is not accompanied by constitutional disturbance, at least in the catarrhal and superficial forms, which are the most frequent. The condition is likely to be serious when associated with streptococcal or staphylococcal infection or if the diphtheria bacillus itself is highly virulent.

R. H. Cantrell⁶ reports the case of a woman, aged 28, which is of interest in being one of *primary diphtheritic vulvo-vaginitis* followed by diphtheria of the skin, and lastly of the mouth and throat. In spite of large doses of antitoxin amounting in all to 125,000 units, death took place from pneumonia. There was no autopsy.

N. E. Berry⁷ reports a case of *diphtheritic urethritis* in a man, aged 45, whose symptoms were frequent and painful micturition and two attacks of retention in the course of three weeks. The meatus was swollen, indurated, and everted, the mucosa was entirely covered with an adherent yellowish membrane, and there was a yellowish watery discharge. Bacteriological examination of the urethral membrane showed an organism which proved to be a true diphtheria bacillus; 15,000 units of diphtheria antitoxin were given during the first week and 5000 units in each of the following two weeks. The urethra became free of membrane in ten days, though it remained much inflamed for weeks. Complete recovery took place, but a similar condition recurred a year later, when a non-virulent diphtheria bacillus was isolated from the urethral membrane, and it was not until heroic doses of antitoxin had been given that recovery took place. Berry has been unable to find a similar case on record, but another instance of diphtheritic urethritis was reported in 1926 by Imianitoff (see MEDICAL ANNUAL, 1928, p. 115).

M. Fayot,⁸ who has collected 130 cases in children, aged from 14 months to 14 years, in whom diphtheria occurred in spite of previous injections of anatoxin, states that *diphtheria in the inoculated* forms about 3.3 per cent of all the cases of diphtheria in France, and has been noted in 11.6 per cent of the cases observed at the Hôpital des Enfants Malades, Paris, in recent years. In Fayot's series malignant diphtheria was much less frequent in the inoculated (6.9 per cent) than in the non-inoculated (12.5 per cent), and the mortality in the former was only 4.8 per cent as compared with 11 per cent in the latter.

G. Amore⁹ studied the *sedimentation rate* in 14 children after they had undergone active immunization with anatoxin with the usual three doses, and found that there was always an increase in the rate, which was all the more marked the larger the amount of anatoxin injected.

J. V. Bates¹⁰ records a case in a boy, aged 17, of fifty-one *Stokes-Adams attacks* in five days due to heart-block following a very severe form of faucial diphtheria. Treatment consisted in frequent subcutaneous injections of adrenalin. The heart made a good recovery, but death from diaphragmatic paralysis took place on the fifty-third day.

A. Celentano,¹¹ who records a personal case, illustrates the rarity of *hemiplegia* following diphtheria by the fact that Léorat saw only 1 example among 1500 diphtheric patients, Leede 4 among 6300, and the reviewer 8 among 11,313. In most of the cases the hemiplegia is due to cerebral embolism

secondary to parietal or apical endocarditis. Celentano's patient was a girl, aged 6 years, who a week after an attack of faucial diphtheria treated by 6000 units of antitoxin developed left flaccid hemiplegia. Fifteen days later, as the hemiplegia was improving, signs of bulbar paralysis developed and proved fatal in five days. There was no autopsy.

W. H. Park, C. Kereszturi, and D. Hauptmann¹² report their observations on the *Schick test after tonsillectomy*: 46 children who had been Schick-positive before the operation were re-tested six months after it, when 18 per cent gave negative reactions. On the other hand, of 47 Schick-positive controls on whom tonsillectomy had not been performed, 21 per cent became negative after about six months. All the subjects came from congested urban districts. The carrier rate was not higher in the controls than in the tonsillectomized children.

PROPHYLAXIS.—H. W. Strauss¹³ obtained immunity in 99 per cent of 103 persons within two months of a single injection of concentrated diphtheria toxoid incorporated with hydrous wool fat. The majority became immune in three or four weeks, and one as early as two weeks. These good results are probably due to the slow absorption and elimination afforded by the hydrous wool fat.

According to P. Quémard,¹⁴ introduction of anatoxin by the nasal route in the form of instillation or insufflation was first employed by Ramon and Zoeller in 1927, who reported encouraging results from its use in about 50 cases. These results were at first confirmed by other observers in France and Italy, but subsequently Ramalhão Barrosa, and Castro in Portugal, and Crouzon, Loiseau, and Laffaille in France, found that it was far from producing such satisfactory results as the subcutaneous method. Quémard comes to the conclusion that the nasal route for injection of anatoxin should be reserved for those whose health does not permit subcutaneous injection, such as the subjects of tuberculosis and renal disease, as well as those in whom the anatoxin reaction is positive. The intranasal method should always be controlled by the Schick reaction.

A. Goldbloom and D. L. Klein¹⁵ state that the interval between the administration of the last dose of diphtheria toxoid by subcutaneous injection and the development of immunity is approximately three months. Prompted by the work of Stewart and Rhoades and Brodie and Goldbloom, who showed the superiority of the intradermal to the subcutaneous route in immunization against poliomyelitis, the writers determined to administer diphtheria toxoid intradermally. A preliminary experiment with 12 Schick-positive children aged from $1\frac{1}{2}$ to 16 years showed that rapid active immunization by intradermal injection of from 0.1 c.c. to 0.2 c.c. was possible. Subsequent experiments confirmed these results. As the result of a study of 47 cases the writers concluded that those who showed strong local and general reactions or strong local but no general reactions were rapidly immunized, i.e., within two weeks to one month, whereas those who were little or not at all sensitive to toxoid were more difficult to immunize. It was also found that individuals with a moderately high titre were very readily immunized, while those with very low titres were very difficult if not impossible to immunize.

TREATMENT.—U. Friedemann and H. Elkeles¹⁶ state that they abandoned the use of drugs expected to increase the irritability of the vasomotor centre after they had become aware that this centre was not involved in diphtheria. On the other hand, they found the application of *hot baths* very helpful in the vasomotor collapse of diphtheria. Symptoms improved at once and the improvement was maintained for hours. The efficacy of this treatment compared with the complete futility of drugs confirmed their conception of the peripheral origin of vasomotor collapse in diphtheria.

H. Dimmel¹⁷ reports 16 cases of very severe diphtheria in children aged from 2 to 13 years, who, in addition to antitoxin and drugs such as glucose, caffeine, and strychnine, were treated by *transfusion*. The donor's blood, mixed with 2 per cent citrate solution, was injected intravenously without exposure of the vein, the average dose being 200 c.c. Seven, of whom 2 were moribund on admission to hospital, died, and 9 recovered. On the other hand, P. von Kiss¹⁸ records two cases of malignant diphtheria in boys, aged 6 and 8 years, who were treated by transfusion as well as by large doses of antitoxin without any benefit. Electrocardiograms and post-mortem examination showed that the direct cause of death lay in impairment of function of the heart which had been damaged by the diphtheria toxin. The writer comes to the conclusion that injection of large quantities of fluid is contra-indicated in diphtheritic cardiac failure, as in such cases the primary seat of the lesions is not in the peripheral circulation but in the heart itself.

A. Strœ¹⁹ reports 17 cases of malignant diphtheria in which throat cultures showed not only diphtheria bacilli but also large quantities of *B. perfringens* and an anaerobic cocco-bacillus. *Anti-gangrene serum* was given simultaneously with large doses of antitoxin, with the result that all recovered except one patient in whom treatment was not started until the sixth day.

J. E. Gordon, D. C. Young, and F. H. Top²⁰ report two cases of post-diphtheritic respiratory paralysis treated by the *Drinker apparatus*, which has been used successfully for poliomyelitis. One, a girl aged 8, recovered, and the other, a youth of 16, died. A greater proportion of recoveries is likely to ensue if the method is started at the first sign of respiratory difficulty.

REFERENCES.—¹*Epid. Rep. Health Sect. League of Nat.* 1934, xiii, 49; ²*Lancet*, 1933, ii, 1141; ³*Amer. Jour. Dis. Child.* 1933, xli, 1338; ⁴*Jahrb. f. Kinderheilk.* 1934, cxli, 318; ⁵*Thèse de Paris*, 1933, No. 483; ⁶*Jour. Amer. Med. Assoc.* 1934, cii, 1293; ⁷*Jour. of Urol.* 1933, xxx, 263; ⁸*Thèse de Paris*, 1933, No. 487; ⁹*Pediatrics*, 1933, xli, 1484; ¹⁰*Brit. Med. Jour.* 1934, i, 619; ¹¹*Pediatrics*, 1934, xlii, 290; ¹²*Amer. Jour. Dis. Child.* 1934, xlvii, 565; ¹³*Jour. Amer. Med. Assoc.* 1933, ci, 192; ¹⁴*Thèse de Paris*, 1933, No. 202; ¹⁵*Jour. of Pediat.* 1933, iii, 113; ¹⁶*Lancet*, 1934, i, 777; ¹⁷*Med. Klin.* 1933, xxix, 1578; ¹⁸*Arch. f. Kinderheilk.* 1934, ci, 84; ¹⁹*Ibid.* 1933, c, 86; ²⁰*Jour. of Pediat.* 1933, iii, 580.

DROPSY, EPIDEMIC. (See BERI-BERI AND EPIDEMIC DROPSY.)

DUODENAL ILEUS.

A. Rendle Short, M.D., F.R.C.S.

Two papers appear on this rather vague but not uncommon ailment, by E. H. Pool, W. L. Niles, and K. A. Martin,¹ of New York, and by E. Kraas and W. C. Beck,² of Frankfurt. Pool has had 11 cases treated by duodenojejunostomy; 7 gave excellent, 2 fair, and 2 doubtful results. The symptoms are chronic, with a feeling of epigastric distension and nausea after meals, perhaps amounting to acute pain at times; there is loss of weight, asthenia, headaches, mental depression, cold hands and feet, and perhaps acne. The patients have often had the appendix removed, or some other abdominal operation, without benefit. The diagnosis is made by demonstrating the stasis by means of barium skiagraphy. Medical treatment should be tried first, and is often sufficient; the patient should be given small frequent meals, and told to rest after them; a hot moist compress over the duodenum after food helps to allay spasm. Phenobarbital and atropine are useful.

According to the Frankfurt writers, there are two types, the one with mechanical obstruction such as duodenojejunal kink, and the other functional. Operation by no means always cures.

REFERENCES.—¹*Ann. of Surg.* 1933, Oct., 587; ²*Ibid.* 1934, Feb., 311.

DUODENAL ULCER. (See GASTRIC AND DUODENAL ULCER.)

DYSENTERY, AMOEBIC. (*See* AMOEBIASIS.)**DYSENTERY, BACILLARY.** (*See also* FOOD AND THE PUBLIC HEALTH.)
Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Prophylactic oral vaccine against bacillary dysentery is reported on favourably in the case of mental patients in an Ontario institution by E. P. James and S. G. Chalk.¹ Flexner strains isolated from patients were grown in broth for four days, the organisms killed by heat, and 10 c.c. of the suspension of dead organisms in the broth given orally in place of the evening meal on the first day, 20 c.c. on each of the next three days, and 40 c.c. on the sixth day, with no appearance of reactions or inconvenience. In 1923, up to October, 37 cases of dysentery had occurred, after which all the inmates, and all new admissions, received the oral vaccine, and no case of dysentery occurred until the winter of 1925-6, when there was an outbreak following the admission of 18 patients, who did not receive the vaccine, with infection of 6 of the newcomers and 6 who had received the vaccine two years before. In March, 1926, all the patients in the ward and new admissions again received the vaccine, and the disease was absent for fifteen months; but in 1928 3 recent admissions contracted dysentery before they had received the vaccine, and 2 similar cases occurred in 1929, together with infection of 4 patients who had been given the vaccine two to four years previously, after which all the patients again received it, and in August, 1932, a few clinical cases, but bacteriologically negative, occurred. The vaccine, therefore, should be given every year to all patients before the autumn dysentery season, and to all admissions, in order to obtain the best results. Agglutination tests in 46 patients showed that all the patients gave positive reactions after a course of the oral vaccine, and in 65 per cent it was found in a dilution of over 1-160, showing a satisfactory response to the vaccine.

REFERENCE.—¹*Canad. Med. Assoc. Jour.* 1933, July, 40.

EAR, AFFECTIONS OF.

F. W. Watkyn-Thomas, F.R.C.S.

RECENT SCIENTIFIC WORK ON THE EAR.

In the MEDICAL ANNUAL for 1933 (p. 148) the experimental method of E. G. Wever and C. W. Bray was described. Recently this method has been applied to various problems of aural function with important results.

The Function of the Saccule.—D. W. Ashcroft and C. S. Hallpike,¹ working on these lines, have investigated the function of the saccule. For many years this part of the labyrinth was regarded as part of the mechanism of body-equilibrium, and different but imposing functions were assigned to it until seven years ago, when A. de Kleyn and C. Versteegh² succeeded in destroying the saccule without damaging the rest of the labyrinth, and found that the animals on which the experiment was done could balance as well as ever. Since then it has been suggested by J. Tait that the saccule is concerned with 'body conducted' vibrations—that it is, in fact, an organ of 'vibration sense'. This view has been confirmed by Ashcroft and Hallpike, who worked on frogs and tested the 'Wever-Bray response' of the isolated nerve of the saccule. Their results suggest also that in man the saccule is concerned in the reception of sounds conducted through bone. If this is the case, we shall be compelled to revise our views on the meaning of alterations of bone conduction in deafness. Until now it has been taken for granted that bone conduction is a rough measure of the activity of the cochlea; if bone conduction in any way depends on the saccule, its measurement will be valueless as a test of the cochlea. Also it is very unlikely that any advance can be made by the use of hearing aids

of a kind which rely principally on bone conduction if that conduction is by the sacculæ and not by the cochlea, which is the normal receptor of speech.

The Function of the Utricle.—W. J. McNally³ has continued his work on the labyrinth by experiments on the function of the utricle. By a new method he can divide any one of the labyrinthine branches of the eighth nerve. His experiments were done on frogs. In one group of animals all the labyrinthine nerves were divided except those going to the utricles; in the second group the branches to the utricles were divided and the other branches left intact. It is fair to conclude that in the first group any labyrinth signs which remained could only have been due to the activity of the utricles, and in the second group that no labyrinth signs could have been due to the utricles. From these experiments it seems clear that the utricle is necessary for continued movement forward but not for restoration of position ('righting reaction'); probably the principal function of the utricle is to prevent over-action of the superior and posterior semicircular canals of the opposite side.

These papers on the sacculæ and the utricle are not only of great scientific value; they promise extensions of clinical importance, one in the study of deafness, the other in the unravelling of the labyrinth signs in disease.

DEAFNESS.

Hearing Aids.—A. R. Tweedie⁴ in a discussion on this subject quoted a leaflet issued by the Nottingham Institute for the Deaf giving advice as to the choice of hearing aids. The suggestions are so clear and of such general applicability that they should be thoroughly studied. They are quoted *in extenso* :—

Aids to Hearing.

General Description.—

These are all divisible into one of the two groups :—

- (A) Some form of 'Collector', an example of which is the well-known Ear Trumpet. (As a general proposition the larger the 'Collector' the more useful the aid.)
- (B) 'Electric Appliances'—all based on the simple telephone, consisting of a microphone, telephone receiver, and a small dry battery. (Amplifiers are sometimes associated with this type of apparatus, capable of producing a very great volume of sound, which may or may not be of assistance.)

Advice as to Selection.—

Collectors are more generally useful than 'Electric' Aids, but are more conspicuous. Electric Aids are sometimes successful. Where amplifiers are added, they are too heavy to be portable. The batteries, of course, require renewal from time to time.

Three No's.—

- (1) No person can decide as to the value of any 'Aid' except the patient.
- (2) No 'Aid' should ever be bought without the previous opportunity of two weeks' trial.
- (3) No instrument maker should be trusted unless he will lend, on approval for two weeks, any 'Aid' which the patient selects as possibly of use; with some reasonable arrangement for hire to cover wear and tear, risk of loss, etc.

The Secretary will be pleased to provide on request a list of Instrument Makers who will conform to the above methods of approval, trial and hire.

Nerve Deafness.—In an important discussion on nerve deafness at the Congress of the Societas Oto-Rhino-Laryngologica Latina F. J. Collet⁵ accepted the classical tests for nerve deafness, and added to them: (1) Exaggerated disproportion between the hearing for the loud and the whispered voice; (2) Better hearing for the 'low-toned' syllables than for the 'high-toned'. He pointed out that nerve deafness may be transient, fixed, or progressive, and that it may be due to a variety of causes which he roughly classified as follows :—

1. *Congenital.*—(a) Heredity, the basis of most cases of deaf-mutism due to malformation or defect of the cochlea; (b) Intra-uterine meningo-labyrinthitis; (c) Birth injuries.

2. *Traumatic*.—(a) Indirect injury, most often by transverse fracture of the petrous and tearing of the nerve, or by ossification of the inner ear; (b) Direct, by explosions or in the occupational deafnesses.

3. *Toxic*.—Poisoning by lead, arsenic, quinine, and salicylates (these last two are characterized by the intensity of the accompanying tinnitus), by alcohol or tobacco, and by various bacterial toxins. As a rule, deafness of this kind is bilateral, sometimes slowly progressive, sometimes sudden in onset; it is seldom associated with vertigo, and is often cured by elimination of the poison. The pathological condition may be injury to the nerve-fibre or to the sensory epithelium; it may be vascular, either spasmodic or sclerotic; last of all, it may be a total degeneration of the peripheral neurone.

4. *In Acute General Infections*.—Nerve deafness here is usually unlike the toxic kind in that it is severe and stationary, with labyrinthitis or meningitis as the determining cause. In diphtheria, influenza, typhoid, and herpes the lesion is probably a neuritis, but in mumps and pneumonia it is probably due to meningitis, and in the post-septicæmic states to a hæmatogenous labyrinthitis. Collet admitted, however, that it is not justifiable to attempt too precise localization.

5. *In Syphilis*.—The nerve deafness may be sudden in onset, or slowly or rapidly progressive. In congenital syphilis it may appear early or late. The pathological lesion may be labyrinthine or in the trunk, meningeal, nuclear, or vascular.

6. *In Tabes*.—Nerve deafness may precede the ataxic signs.

7. *In Blood Diseases, Chronic Infections, and Disorders of Nutrition*.—Nerve deafness is usually secondary to hæmorrhage, anæmia, arteritis, or neuritis.

8. *In Chronic Arterial Lesions*.—The deafness is characterized by steady advance with or without additional secondary labyrinthine or cochlear disturbance (vertigo and tinnitus). The pathological basis is a degeneration of the peripheral neurone, which goes on to atrophy of the organ of Corti, the ganglion, and the nerve trunk. It should probably be regarded as an atrophy secondary to interference with the blood-supply by chronic endarteritis.

9. *In Chronic Otitis Media* are included "certain kinds of otosclerosis involving the bony capsule of the cochlea, rare cases of otosclerosis limited to the cochlea", and some cases of dry otitis media with loss of bone conduction and impairment of high-tone hearing. [Such cases are usually regarded by British otologists as pure otosclerosis.—F. W. W.-T.]

10. *In the Neuroses*.—Deafness, often persistent and sometimes complete, is found in some cases of neurasthenia, hysteria, and epilepsy.

11. *With Cerebral Tumours*.—(a) Tumours of the cerebellum cause deafness, unilateral or bilateral, usually by direct pressure; (b) Tumours of the medulla and pons if in the posterior part cause unilateral deafness by direct pressure on the nerve, if in the anterior part bilateral deafness by involvement of the trapezium; (c) Tumours of the corpora quadrigemina cause moderate deafness, usually unilateral and usually on the opposite side; (d) Cerebral tumours cause deafness by increase of pressure in the labyrinth (either by the general increase of pressure of the cerebrospinal fluid or by obstruction of the venous return), or by interference with the facial or trigeminal nerves, which supply the intratympanic muscles.

E. Urbantschitsch⁶ describes a case in which nerve deafness was caused by injection of *tutocain*. An injection of 2 per cent *tutocain* was being made before tonsillectomy under local anæsthesia when the patient became very giddy and complained of tinnitus. The tonsils were removed, but that afternoon the deafness and vertigo increased. Two months later there was still

tinnitus, and vertigo on stooping; the deafness had improved, but the hearing was not yet perfect.

Dida Dederding⁷, from a study of *deafness in brain diseases*, has come to conclusions differing somewhat from those of Collet. She found that the first state of deafness in the presence of an intracranial tumour was usually a low tone loss such as is found in otosclerosis and middle-ear deafness. She attributes this to the fact that a rise of pressure *within* the labyrinth will immobilize the stapes and the round window just as effectively as adhesions or fluid in the middle ear outside the labyrinth. Such a rise of pressure would be caused by a tumour which raises the pressure within the cranial cavity and so blocks the normal escape of labyrinthine fluids. Later on the nerve-endings degenerate on account of the continued intralabyrinthine hypertension, and then, but only then, the signs of nerve deafness are found. The suggestion that raised intracranial pressure can cause 'choked labyrinth' as well as 'choked disc' was made by Fischer and Alexander some years ago, but if it can be shown that these changes in the high and low limits follow an orderly sequence, it may be possible to use increasing loss of hearing as a measure of the rise of intracranial pressure, just as we now use the degree of swelling of the disc.

S. J. Crowe, S. R. Guild, and L. M. Polvogt⁸ have *examined histologically* the inner ears of 79 patients who during life had loss of high tones as proved by audiometer tests. They have confirmed the findings of other workers who have stated that the receptors for high tones are in the basal turn of the cochlea. Their subjects come under two main groups, those with a 'gradual loss' for high tones, increasing steadily as the test goes up the hearing scale, and those with an 'abrupt loss'. The 'gradual loss' seems to be associated with atrophy of the nerve-fibres to the basal coil, the 'abrupt loss' with degeneration of the organ of Corti. The 'gradual loss' is commonly found with arterial changes, but no definite cause could be assigned to the other cases.

J. Koch⁹ has examined the hearing in 146 patients who had sustained *head injuries*. The examinations were done repeatedly at intervals of from three to six months. His cases are arranged in three groups:—

1. Eighty-five cases of fracture with proved damage to the temporal bone: 80 were cases of longitudinal fracture with middle-ear injury; in 5 there was transverse fracture of the labyrinth. In all cases in this group hearing was impaired: total unilateral deafness in 19, inner-ear deafness in 14, middle-ear deafness in 32, mixed deafness in 20.

2. Fourteen cases of fractured skull without obvious injury to the temporal bones: deafness in 12 cases, varying from slight to total.

3. Forty-seven cases of '*commotio cerebri et labyrinthi*' without fracture; 39 cases of cochlear impairment, of which 7 were complete.

Koch accepts the view of Wittmaack (*see* MEDICAL ANNUAL, 1933, p. 149) that the labyrinth injury in the cases without fracture is due to sudden compression of the organ of Corti by the labyrinth fluid. In the cases where the injury was principally of the middle ear the hearing usually recovered to a large extent, but in the simple concussion cases and in transverse fractures the deafness was usually permanent. The vestibular function also often returned, but sometimes disturbances of equilibrium lasted for three years after the injury.

It is clear from a study of these papers that nerve deafness is far more complex than was once believed, and that our knowledge of it is still only rudimentary. At the same time it is equally clear that many cases are due to remediable causes and that it is no longer justifiable to condemn all cases of nerve deafness as hopeless and incurable.

SUPPURATIVE CONDITIONS OF THE EAR.

Mucosus Otitis.—This has been known for some years, and recently has attracted much attention on account of its insidious onset and the dangerous degree of bone destruction which occurs almost without symptoms. H. Rollin¹⁰ summarizes a series of cases. He describes the organism as the *Streptococcus mucosus*. [In this country and in America it is generally believed to be a pneumococcus and is described as '*Pneumococcus III*'.—F. W. W.-T.] The condition is comparatively rare in children. There is little pain, scanty discharge, and only slight change in the membrane. At operation the foci of suppuration are often found in the peripheral cells, not in the antrum itself. The danger period for intracranial complications is the sixth week and after. Six fatal cases are described. In all of them a fulminating meningitis had followed an apparently mild otitis. In all of them the focus directly responsible for the meningeal invasion was a group of cells near the upper ridge of the petrous bone in the region of the attic. Rollin believes that the organism spreads along the subepithelial tissue in the lining of the air cells until an outlying cell, shut off from the neighbouring cells, is reached and there it forms the outlying focus.

[This paper emphasizes the need for rigorous supervision of all cases of otitis media which do not 'clear up' completely with adequate drainage. In most cases of 'mucosus otitis' the persistent pallid infiltration of the drum and the slight recurrent pains should warn us of possible danger. Further, where pallid 'granulations' or 'swollen lining membrane' is found in a cell the most ruthless extirpation of every discoverable mastoid cell is imperative.—F. W. W.-T.]

Suppuration of the Petrous Bone.—This dangerous complication receives increasing attention. Thirty years ago G. Gradenigo described a syndrome of trigeminal neuralgia, external rectus palsy, and mastoiditis. S. J. Kopetzky and R. Almour in 1930 gave a full account of the condition and described a method of reaching and draining the petrous apex by drilling the bone between the cochlea and the carotid canal (*see* MEDICAL ANNUAL, 1932, p. 150). In a recent paper¹¹ they review the position. They regard infection of the petrous apex as being of two types; (1) *Acute*, characterized particularly by retro-orbital pain and profuse discharge, sometimes accompanied by external rectus paralysis; and (2) *Chronic*, which does not, as a rule, show the retro-orbital pain and can be suspected only by profuse discharge persisting after an adequate operation on a cellular mastoid; diagnosis depends on skiagrams or exploration. They add that 'blurring' of cells in the petrous must not be regarded as diagnostic; there must be definite destruction of the cell-walls.

E. P. Fowler¹² remarks that petrositis is much more common than is generally supposed, and describes six fatal cases. It is noteworthy that in three of them the infection was a 'mucosus'—*Pneumococcus III*. In some cases the bone was not cellular up to the tip, and in these cases the lesion was an osteomyelitis. As a rule, petrositis subsides spontaneously with adequate drainage of the middle ear. [This is borne out by the well-known clinical observation that most cases of external rectus palsy with mastoiditis are cured by a simple mastoid operation, without further intervention.—F. W. W.-T.] He points out also that the route of invasion to the meninges may be through a subdural abscess, through veins draining the carotid sheath, through the labyrinth, or through the veins draining the area.

H. Aloin¹³ believes that the condition occurs only in the cellular or pneumatic petrous and that the nature of the infecting organism is of secondary importance. At the same time he speaks of the dangers of 'torpid' infection and remarks that the membrane, even after incision, may give little evidence

of the severity of the infection; we have already noted these points as characteristic of mucosus otitis. As well as the neuralgic retro-orbital pain, which is worse at night, Aloin attaches great importance to transient vertigo. [This is usually a sign of invasion in the posterior portion of the petrous via the perilyabyrinthine cells and is not seen in the early stages when the invasion has taken place through the cells around the Eustachian tube.—F. W. W.-T.] Aloin finds that, as a rule, a simple mastoid operation is sufficient to effect a cure, but recurrence of symptoms and abnormally profuse discharge usually mean an extension of suppuration which calls for radical intervention.

J. Ramadier,¹⁴ in cases where the route of infection is through the peritubal cells, attacks the apex along the carotid canal. He points out that there is little danger of wounding the artery, and even if it is wounded, the bleeding can easily be controlled by packing, as the artery loses its elastic coat when it enters the petrous canal, and is a purely muscular tube. He divides his operation into four stages: (1) Radical mastoidectomy enlarged forwards to expose the anterior part of the tympanum and the tubo-carotid region; (2) Opening the carotid canal at the level of the posterior-inferior angle of the tubal orifice; (3) Removal of the antero-supero-external wall of the carotid canal; (4) Opening and curetting the petrous apex above and behind the exposed carotid artery.

P. Frenekner¹⁵ has devised a method for reaching the apex when the infection enters the petrous through the perilyabyrinthine cells. He carefully exposes the canals, without injuring them, by removal of the surrounding bone, and then clears out the spongy bone filling the arch or loop of the superior canal. With a small, very sharp curette he passes through the arch of the canal and breaks away the bone until the apex is reached. Lastly, in some cases it would be possible to reach the infected region by an operation described in 1929 by W. P. Eagleton¹⁶ and called by him "unlocking the petrous pyramid". The mastoid antrum is opened and the bend of the lateral sinus is exposed. The solid angle of the petrous is cleared away above the sinus until the superior petrosal sinus is free in its groove. The zygoma is shaved down until the temporo-mandibular joint is exposed. Lastly, the squama of the temporal is removed and the petrous cut away until the superior semicircular canal is exposed.

A. A. Sjöberg¹⁷ deals with the *anatomical basis of the signs of apicitis*. He gives radiological proof of the statement that apicitis may subside without any other treatment than a simple mastoid operation; in fact it may subside without any operation. The frequency with which skiagrams show changes at the apex make it difficult to accept the view put forward that external rectus palsy may be due to mild otogenous meningitis without any apical infection, or to a toxic neuritis.

The orbital pain is probably not due to irritation of the Gasserian ganglion, but either to pressure on the filaments of the ophthalmic division of the fifth nerve in the abducens nerve, or, more probably, to irritation of the recurrent meningeal branch of the ophthalmic division which passes over the apex of the petrous pyramid.

THE TREATMENT OF MENINGITIS.

In the MEDICAL ANNUAL last year (p. 298) Otto Mayer described a short series of cases in which cure had followed the injection of air into the cerebro-spinal spaces. O. Zeller¹⁸ describes a method based on the same principle—breaking down subarachnoid adhesions—but with considerable differences in technique. Zeller removes as much cerebrospinal fluid as possible, unlike Mayer who only removes fluid until normal tension is reached, and then *inflates the*

intrathecal space with acetylene gas, which he says is easily absorbed and which he believes to be non-irritant and to have a bactericidal action. The neck is constricted and hypertonic saline solution is injected intravenously to stimulate the re-formation of cerebrospinal fluid. He also suggests that intrathecal injections of digestive ferments, such as papain, would be helpful when the fluid is thick. Such injections should be made into the ventricle or across the orbital cavity. In one case an attempt at active immunization by intramuscular injection of the infected cerebrospinal fluid may have helped in the cure. [The number of cases in which this inflation has succeeded is still far too small for us to say more than that the method offers some hope. It is based on rational principles, but from the available reports it does not seem yet to have had any wide measure of success. The great difficulty in active immunization is the relative impermeability of the choroid plexus to immunity bodies.—F. W. W.-T.]

Further work on the treatment of meningitis by *intracarotid injection of antiseptics* (colloidal iodine and acriflavine base) has been done by M. S. Ersner and David Myers.¹⁹ They regard the treatment as valuable and believe that the arteries "can stand a reasonable amount of abuse". They summarize their conclusions as follows :—

1. Intracarotid therapy offers a ray of hope in the treatment of an almost fatal complication.

2. A technique has been developed which will minimize extra- and intravascular changes, especially thrombosis of the vessel, atheromatous changes, and aneurysm.

3. The intima suffered less injury than any other portion of the artery; the media revealed areas of necrosis, hyalinization, and infiltration with various cells.

4. The adventitia seemed to bear the brunt of pathological changes, showing necrosis, infiltration, and almost approaching abscess formation.

5. Both carotid vessels should be utilized in order to bring the medicaments in contact with both sides of the brain.

6. The arteries can stand a reasonable amount of trauma, provided considerable care and caution are exercised.

7. There is no doubt that a certain amount of damage is done to the carotids following intracarotid therapy; this, however, should not deter anyone from employing this method in the treatment of meningitis.

Several important points in operative technique are mentioned :—

1. The injection should be made into the common carotid, as the internal carotid is difficult to reach. Circulation through the external carotid must not be interfered with, but during the actual injection the external carotid must be temporarily occluded to prevent wastage of injection into it. This is done by passing under it an oiled tape, which is released as soon as the injection is finished.

2. The fascial covering of the vessel must not be stripped, or the vasa vasorum will be damaged, and an unintended periarterial sympathectomy will be performed as well.

3. The wound must be kept filled with sterile oil between the injections.

4. In cases of otitic meningitis it might be well to use the vertebral arteries. The anatomical difficulties are considerable.

H. von Neumann²⁰ gives the results obtained by him over a period of six years. Fifty-nine cases of otitic meningitis were treated, with 22 recoveries. His operation, which is specially adapted for treating meningitis coming on during acute otitis media and without labyrinth invasion, resembles that already described by Eagleton. In *Neumann's operation* the structures in the

middle ear are preserved by keeping above the tympanic membrane. The outer attic wall is freely removed and the tegmen tympani et antri easily reached. Particular attention is paid to the posterior angle of the petrous. Neumann gives cyclopropine intravenously. It is remarkable that in Neumann's series only one of the patients who recovered was over 15 years of age.

E. Ruttin,²¹ following the lines laid down by Neumann—translabrynthine drainage of the basal cisterns for translabrynthine infection and the Neumann operation for other cases of otitic meningitis—has succeeded in curing about 50 per cent of his cases. He supplements the treatment by daily lumbar puncture and intrathecal injections of solganal. Neumann has abandoned this drug, for he regards its utility as doubtful, and it sometimes causes severe pain and even paraplegia.

(See also BRAIN, ABSCESS OF.)

REFERENCES.—¹*Jour. Laryngol. and Otol.* 1934, xlix, 450; ²*Ibid.*, 1927, xlii, 649; ³*Laryngoscope*, 1934, xliv, 50; ⁴*Proc. Roy. Soc. Med.* 1934, Feb., 419; ⁵*Presse méd.* 1933, Oct. 11; ⁶*Zeits. f. Hals-, Nasen- u. Ohrenheilk.* 1933, xxi, 671; ⁷*Acta Psychiat. et Neurol.* 1933, viii, 165; ⁸*Bull. Johns Hopkins Hosp.* 1934, May, 315; ⁹*Arch. f. Ohr, Nasen u. Kehlkopfheilk.*, 1933, cxxxvii, 105; ¹⁰*Ibid.* 333; ¹¹*Ann. Oto-Rhino-Laryngol.* 1933, xliii, 802; ¹²*Jour. Amer. Med. Assoc.* 1934, May, 19; ¹³*Ann. d'Oto-Laryngol.* 1933, Feb.; ¹⁴*Ibid.* 1933, April; ¹⁵*Acta Otolaryngol.* 1932, xvii, 97; ¹⁶*Jour. Laryngol. and Otol.* 1929, xliv, 657, 721; ¹⁷*Acta. Otolaryngol.* 1934, xix, 479; ¹⁸*Wien. klin. Woch.* 1933, ii, 847; ¹⁹*Laryngoscope*, 1933, xliii, 630; ²⁰*Rev. de Laryngol.* 1934; ²¹*Wien. klin. Woch.* 1934, i, 534.

ELECTRICAL INJURIES.

Macdonald Critchley, M.D., F.R.C.P.

The widespread employment of electricity in industry and in the home has not unnaturally led to an increasing number of accidents. Although comparatively little interest in the subject has been evinced in Great Britain, a considerable amount of work has been carried out on the medical problems connected with electrical shock both on the Continent and in North America, where, incidentally, the accident-rate is considerably higher. Data of an experimental character have also resulted from a study of electrical injury to animals. The mortality figures are swelled to a minor extent, too, by the cases of legal electrocution in the United States, and by the occasional instance of suicide by electrical shock. Within recent years in England and Wales the development of the National Grid System has done something to focus attention upon this potential source of danger.

Details of statistics for England and Wales as well as of the clinical types of electrical injury are contained in recent papers by M. Critchley.^{1, 2} According to this author, the number of deaths per annum in Germany is about 400; in the U.S.A. the corresponding figure is about 750; while in England and Wales the average annual mortality in the last decade was less than 43.

Certain electrotechnical factors are important in determining the severity of electrical injury in the human: (1) Voltage—high voltages are usually more dangerous than low. Death has, however, occurred from as little as 46 volts, while shocks from high tension (i.e., over 1000 v.) may produce but little harm. Shocks from the electric-light main (about 240 v.) are frequently fatal. (2) Amperage is a still more important factor than voltage. A current of 20 milliamperes applied suddenly is painful; 70 to 80 milliamperes is dangerous, while 500 milliamperes is essentially a lethal strength of current. (3) Type of current: volt for volt, alternating currents are more dangerous than direct. (4) Resistance of the tissues. Skin offers a considerable barrier to the entry of an electric current, especially when dry and horny. The palm of a workman's hand is said to have a resistance of 1 to 2 million ohms. Sweating lowers the skin resistance twelve times; in water the resistance drops to one-twenty-fifth. Blood and cerebrospinal fluid are the best two conductors.

According to Larrat, if the resistance of muscle is 1, that of nerve and cartilage is 2-5; of bone 15-20; and of skin and epidermis 100-500. One inch of sciatic nerve is said to have eight times the resistance of the Atlantic cable. (5) Duration of the current. The danger increases directly with the duration of the stimulus. (6) The location of the points of contact is important in that it determines the route taken by the current through the body. This in turn will determine whether the cerebral, cardiac, or respiratory mechanisms are most directly implicated.

A large number of electrical shocks prove fatal. It is customary to distinguish four or five modes of exitus: (1) Immediate death; (2) Slow death which takes place while the current is passing; (3) Interrupted death, where the patient recovers consciousness only to die a few minutes later; (4) Late death, where the patient dies quite suddenly, hours or even days after the accident; and (5) Delayed death from complications. It is interesting to recall that we are still uncertain of the precise cause of death after electrical shock, and experimental data are largely of a contradictory nature. The most commonly held view of to-day is that currents of low voltage cause death by producing a condition of ventricular fibrillation, while high-tension currents cause a paralysis of the respiratory centres in the brain-stem.

A point of great practical importance lies in the belief that after an electrocution the victim may appear to be dead, but is nevertheless capable of resuscitation by means of artificial respiration, promptly instituted and kept up over a long period of time.

In the case of non-fatal electrical accidents various clinical phenomena may be produced. Besides the immediate effects of the current, interesting remote sequelæ of an ophthalmological or neurological nature develop at times.

Unconsciousness usually occurs if the amperage is high, or the contact prolonged. There are at least two clinical types of unconsciousness, (1) immediate unconsciousness from syncope, and (2) abrupt unconsciousness which may last for several hours. Lumbar puncture at this stage usually reveals increased intracranial pressure and sometimes red blood-cells; at times the temperature of the spinal fluid is raised. Motor agitation is frequent and the clinical picture bears a striking resemblance to Symonds' traumatic delirium seen after head injury.

When unconsciousness does not occur the victim of an electric shock usually experiences sensations of a peculiar and often agonizing character. Tonic muscular rigidity may cause a powerful contraction of the flexors of the fingers so that the victim may be unable to free himself. The pain of a shock may be referred not only to the segment in immediate contact with the source of current but may become generalized and most intense. Violent contraction of the whole musculature of the body together with local burning accounts for the pain. In a few instances observed by the reviewer no pain whatever has been experienced. Various complex associated sensations may be noted. Thus temporary tinnitus and deafness are common, and disorders of vision may be noted, such as blackness or hallucinatory flashes of light.

Burns and necroses result from the liberation of heat produced by the resistance of the cutaneous barrier. The chief skin lesions are: (1) burns, (2) electric current marks, (3) gangrene and necroses, and (4) 'metallization' of the skin.

Electrical burns have recently been studied by H. Long.³ According to Jellinek, the term 'burn' is a misnomer, as the electric lesions differ in many clinical and histological particulars from other types of burn. Jellinek believes that electric burns are painless, aseptic, and tend to heal rapidly. They are, however, apt to spread within the first three weeks; this tendency when

associated, as it usually is, with a frequent abnormal friability of the adjacent blood-vessels, may lead to dangerous secondary hæmorrhages.

Electrical marks are found at the points of entry and exit of the current, appearing as greyish-white painless spots. With very severe injuries, intense destruction may occur, involving muscle, bones, and nerve-trunks—or may virtually amount to amputation. ‘Metallization’ of the skin comprises the impregnation of the epidermis with minute fragments of metal conveyed from the conductor.

Bony injuries are not uncommon, and comprise transverse fracture or—more usually—longitudinal fissuring (schisis). More rarely bones are fractured or dislocated by the sheer violence of the muscular contractions.

When electrical currents pass through the head various changes may appear in the visual apparatus, either immediately or after an interval. Commonest of these is the so-called ‘eye-flash’, ‘dazzle’ or ‘electric ophthalmia’. Retinal burns are much rarer. Disorders of the pupillary mechanism or of the ocular movements may occur.

Numerous trophic disorders may be seen after electric shock. Chief among these are œdema, spasms of the arteries, falling out of the hair or canities, tachycardia, vasomotor disorders. A few examples of electrotraumatic auricular fibrillation are on record.

Amongst the central nervous symptoms which may rapidly succeed an electric shock may be mentioned persistent cramps, spasms, pain, and tingling in the segment through which the current has entered or left the body. In such cases slight alterations in the reflexes may be demonstrable. Hysterical palsies are by no means rare.

Of great clinical as well as medico-legal interest are the occasional late complications of electrical injuries—usually referable to the central nervous system. These have been particularly studied by F. Panse⁴ and by M. Critchley. They may be conveniently tabulated as follows :—

1. *Cerebral* :—
Hemiplegia, with or without aphasia
Striatal syndromes
Epilepsy
Post-concussional states
Cerebellar syndromes.
2. *Spinal* :—
Spinal-atrophic palsies
Hæmatomyelia
Spastic paraplegia.
3. *Mixed Cerebrospinal Affections* :—
“Electro-traumatic encephalomyeloses.”
4. *Peripheral Nerve* :—
Isolated or multiple neuritis
Neuralgias.
5. *Psychological Disorders* :—
Including neuroses, psychoneuroses, and psychoses.

It is important to exclude carefully those mechanical complications of the accident not directly connected with the current. Such would comprise the mechanical effects of the fall. Secondly, it must be remembered that the first symptoms of a well-recognized non-traumatic nervous disease (e.g., tabes, disseminated sclerosis) may immediately follow an electrical injury.

Ocular sequelæ constitute the other chief group of late effects of electrocution. Of these, cataract is the best known. It may appear after an interval varying from a few days to several months or even a couple of years. One eye or both may be affected. Unilateral or bilateral optic atrophy is also a well recognized late effect of electrical injury.

TREATMENT.—An account of the treatment of electrical accidents is naturally divisible into various heads: (1) Liberation of the victim from the circuit; (2) Emergency treatment for shock and 'apparent death'; (3) Treatment of unconsciousness; (4) Treatment of the burns, fractures, and tissue necroses; and (5) Management of complications.

1. *Liberation of the Victim.*—No one should grasp the victim or the victim's clothes with the bare hands. If rubber gloves are not available, the hands should be protected by layers of cloth or paper. It may be simpler to push the victim away from the apparatus by means of a wooden stick or pole.

2. *Emergency Treatment.*—Artificial respiration should be started at once, even before the doctor is summoned. Even if the victim is believed to be dead, artificial respiration should be carried out. Either the Schäfer or the Sylvester method can be employed, the former being the more usual in this country. The usual instruction given to a layman is: continue artificial respiration without interruption until natural breathing is restored (if necessary, for 4 hours or longer), or until a physician declares life to be extinct.

Methods of 'counter-shock' (pummelling, shaking, or jarring the victim) have no scientific support for their employment, although frequently advocated by the layman.

3. *Unconsciousness.*—Hot bottles, blankets, hot coffee per rectum, and cardiac stimulants may be required as soon as the patient recovers consciousness. Special importance should be paid to prompt lumbar puncture as a therapeutic measure at this stage.

4. *Local Lesions.*—The special features of electrical necroses influencing treatment include: (a) The unusual depth of the lesions and their circumscribed nature; (b) The rigidity and friability of the surrounding blood-vessels; and (c) The tendency of the lesions to spread. Jellinek advocates a conservative type of treatment, and teaches that early amputations and tissue-resections should never be adopted. Application of simple antiseptic vaseline dressings and the use of a splint are suggested. Active hyperæmia may be induced if necessary, by the application of benzene compresses for fifteen minutes daily. Tannic acid applications also prove satisfactory.

5. *Complications.*—During the third week there is a grave danger of reactionary hæmorrhage. This complication should never take the nursing staff unawares, and instruments and dressings should always be at hand. Ligation of the principal blood-vessels may be required, and should always be carried out at some distance proximal to the bleeding-point. Similarly amputations, when necessary, should be carried out well above the limits of the necrosed area.

REFERENCES.—¹*Jour. State Med.* 1932, xl, 459; ²*Lancet*, 1934, i, 68; ³*Med. Press and Circ.* 1934, 101; ⁴*Schädigungen des Nervensystems durch technische Elektrizität*, 1930, Berlin: Karger.

Sir W. I. de C. Wheeler, F.R.C.S.I.

An electrical accident may produce a deep momentary period of shock or fright, or a state of deep unconsciousness. Should the latter persist the patient passes into the dangerous state known as 'suspended animation'. However severe the shock, suitable treatment must be immediately undertaken.

H. Long¹ deals with the clinical features and treatment of these injuries. Silvester's method of artificial respiration should be employed and continued for at least an hour, even in the apparent absence of success. Lumbar puncture should be performed to relieve the rise of cerebrospinal pressure, which is believed to be a feature of the more severe cases. If the patient relapses, the lumbar puncture should be repeated. Necrosis caused by electricity heals readily. Secondary hæmorrhage is to be feared in the course of healing.

The passage of electric energy through a long bone which lies in the path of the current may give rise to a fine crack, which is zig-zag in form and is at first only visible microscopically, the X-ray taken immediately after the accident being completely negative. Such a lesion is always characterized by a localized pain in the limb of the affected area. At the end of from three to six weeks the crack may become wider and visible radiographically. A peripheral neuritis is another change which may follow the passage of electric current through the limb. The prognosis is good.

REFERENCE.—¹*Med. Press and Circ.*, 1934, Jan., 31, 101.

ELECTROCARDIOGRAPHY. (*See also* ANGINA PECTORIS; CORONARY ARTERY DISEASE; HEART IN MYXÆDEMA.) *A. G. Gibson, M.D., F.R.C.P.*

D. Robertson¹ describes a new electrocardiograph employing the cathode-ray oscillograph as the recording device. The cathode-ray tube has no apparent inertia and enables an immediate visual observation of the electrocardiogram to be obtained by the use of a fluorescent screen. The oscillation is easily adjustable and can be made large or small without distortion. The apparatus is portable and can be worked off electric-light mains. It is not easily damaged by a high voltage. The advantage of this instrument lies in the fact that the electrocardiogram can be easily watched for any length of time in any of the three leads and a diagnosis can be made at once without necessarily waiting for the photographic record.

C. Lian, F. P. Merklen, and J. Odinet² have devised a technique for obtaining electrocardiographic records from different chest leads. When the leads are in certain positions it would appear that more accurate records of the different parts of the heart can be obtained. For the right auricle they use the manubrium sterni and a point over the third or the fifth intercostal space just to the right of the sternum. By this lead the fibrillation of the auricle in auricular fibrillation is much more easily seen. For the left ventricle the electrodes are placed on the apex and on the anterior axillary line near the armpit. By this lead pulsus alternans is more easily demonstrable. For the right ventricle they suggest points at the right anterior axillary border near the armpit and at the base of the xiphoid cartilage.

A. A. Goldbloom³ has tested the value of Lead IV (the antero-posterior chest lead) of the electrocardiogram in 86 cases. This lead has been found to show up cardiac abnormality not detected by the other leads. Tested on 25 normal cases this record consists of a diphasic QRS complex with a deep Q wave. The T wave may be negative or diphasic. Abnormalities in this lead consist in the absence of the Q wave, slurring of the QRS complexes, and absent or upwardly directed T waves. In a group of 40 cases of coronary artery disease 3 cases only (7.5 per cent) showed abnormality in Lead IV only. The abnormality in Lead IV may persist in coronary thrombosis long after abnormal changes have disappeared from the routine three leads. Its employment is recommended as a routine electrocardiographic method.

C. Lian, V. Golblin, and S. Steinberg⁴ find a particular type of record in the electrocardiogram of the third lead which they associate more commonly with angina pectoris. This variation is what they term 'isodiphasisme'. It consists in an equality in the depth of the Q wave with the height of the R wave. Amongst 13 cases in which this was found 11 showed angina pectoris. This is not to be taken as proof but rather as an indication, for in a search for this abnormality they found it in one subject apparently normal, a case of hyperthyroidism, and a case suffering from hypertension.

R. France⁵ confirms the fact that a large Q wave in Lead III which is sometimes present in the absence of heart disease is frequently associated with

serious myocardial damage. When this wave is present together with other evidence in the record of myocardial damage, the patient frequently suffers from angina pectoris. In 12 out of 103 patients investigated, post-mortem evidence showed that the lesion associated with this abnormality is more likely to be in the field of the right coronary artery which supplies the posterior wall of the left ventricle.

A. H. Barnes⁶ has attempted to *correlate the electrocardiogram with the cardiac lesion found after death*. He finds that no other cardiac lesion than infarction gives the typical RST modification of the electrocardiogram that has been so far associated with it. In no instance in which a typical T1 or T3 type of electrocardiographic change developed did he fail to find myocardial infarction. The discrepancies were found to be the result of the tracing not having been taken at the proper time or sufficiently often, or an insufficient investigation of the heart for evidence of infarction. In the discussion which followed the reading of this paper, L. N. Katz said that in a series of 34 patients who had died it had not been possible to predict the position of the infarct from the electrocardiogram, thus confirming the earlier work of Gilchrist and Ritchie.

C. C. Maher, C. P. Sullivan, and C. P. Scheribel⁷ found that with the *administration of quinidine sulphate*, 30 to 60 gr. orally per day, the electrocardiograms showed a flattening of the T waves in Leads I and II. When quinidine was given intravenously the T wave became iso-electric or sharply inverted. The patients subjected to this test were not suffering from any serious cardiac disease.

A. M. Master⁸ finds that *right ventricular predominance* occurs most frequently in chronic valvular disease. The greatest number (57 per cent) are cases of mitral stenosis, 21 per cent occur in degenerative heart disease, and a further group in thyroïdal disease, bronchial asthma, emphysema, and congenital heart disease. Right ventricular predominance with inversion of T3 alone, or of both T2 and T3, is the characteristic electrocardiographic feature. More or less permanent T wave inversion is not necessarily indicative of a morbid process in the heart muscle. When right ventricular predominance occurs with inversion of both T2 and T3 it is associated with a more marked right ventricular enlargement and great enlargement of the pulmonary conus and left auricle, and congestion of the lungs with increase in lung markings in the X-rays.

REFERENCES.—¹*Proc. Roy. Soc. Med. (Sect. Med.)* 1934, xxvii, Oct., 83; ²*Arch. des Mal. du Cœur*, 1934, April-May; ³*Amer. Jour. Med. Sci.* 1934, clxxxvii, 489; ⁴*Bull. Soc. méd. Hôp. de Paris*, 1933, Dec. 15; ⁵*Amer. Jour. Med. Sci.* 1934, clxxxvii, Jan., 16; ⁶*Jour. Amer. Med. Assoc.* 1933, Dec. 30, 2147; ⁷*Amer. Jour. Med. Sci.* 1934, clxxxvii, Jan., 23; ⁸*Ibid.* 1933, Nov., 714.

EMBOLISM. (See BLOOD-VESSELS, SURGERY OF.)

EMBOLISM, PULMONARY. (See CORONARY ARTERY DISEASE.)

EMPYEMA, ACUTE.

A. Tudor Edwards, M.Ch., F.R.C.S.

There is little new of merit to record in the last year's literature on acute empyema. There appears to be a definite agreement on the value of air-tight drainage of the chest in such cases, and if anything a tendency to the use of some form of apparatus which will allow of high negative pressure being used as a means of expanding the locally collapsed lung. M. Tiegel¹ describes such an apparatus which allows of irrigation and suction as is required and evades the necessity of repeated dressing. In other cases intercostal drainage by means of trocar and cannula is the method of choice. Coquelet² summarizes the advantages of closed intercostal drainage as: (1) Reduction of mortality;

(2) Diminution of the incidence of chronic empyema ; (3) Slow evacuation of pus with lessened shock due to violent displacement of the mediastinum ; (4) Simple technique and few dressings ; and (5) Diminished time of hospitalization. [This method is not always so satisfactory as this author would appear to suggest, and its value in the avoidance of chronic empyema will materially depend upon recognition of the moment at which, in certain cases, it is advisable to substitute rib resection for intercostal drainage.—A. T. E.]

E. Graham,³ on the other hand, feels that the whole question of the treatment of empyema has been confused by over-emphasis on details of treatment and therefore lack of regard for underlying principles. He is of opinion that the use of repeated aspiration and closed intercostal drainage as methods of treatment have periods of popularity which correspond to the periods of incidence of the milder types of pneumonia, and the periods in which they decline in use to those epidemics which have a high mortality. By means of statistical tables he shows that the mortality of pneumonia and empyema over a period of years, when graphed, show a corresponding curve, those developing empyema being on a lower level. Furthermore, regarding the prevention of chronicity, after trials of various procedures he is convinced that the most satisfactory methods of treating a case of acute empyema is by drainage following rib resection. Necessarily, during the formative period of the empyema Graham employs aspiration or intercostal drainage, but when definite localization has taken place, whichever preliminary method is employed should be replaced, at the appropriate moment, by rib resection and drainage. He goes so far as to suggest that many of the cases which are considered to have been cured by aspiration have never been true empyemas, as in nearly every case of acute pneumonia some fluid may be found in the pleura, often containing leucocytes and pathogenic organisms, which in most cases is absorbed spontaneously. [In all the above observations the reviewer entirely concurs.—A. T. E.]

Tourof⁴ records 12 cases of *epidiaphragmatic empyema*, which he terms, after Wessler, 'infrapulmonary empyemas'. These consist of encapsulated collections of pus localized between the base of the lung and the diaphragm. They may originate from the lung—the most common—or by extension from subphrenic infection. All types of organisms may be found in these empyemas. Tourof⁴ classifies them into three groups: (1) Those localized between the diaphragm and the lung which do not come into contact with the chest wall at any point ; (2) Those in which, after reaching a certain size, the purulent collection dissects its way beneath the margin of the lung at a certain point, thereby coming into immediate contact with the chest wall, the most common point being in the neighbourhood of the costo-vertebral groove ; (3) Combination of (1) and (2), in which, although the major portion is infrapulmonary, the pulmonary margin becomes elevated owing to absence of adhesions of the lung to the diaphragm.

Apart from the usual symptoms of empyema, a characteristic feature of these cases is the history of pain in the early stages being referred to the shoulder when the central portion of the diaphragm is involved first, and to the lower chest and upper abdomen when the peripheral portions of the diaphragm are first implicated. Signs vary according to the type, i.e., in Group 1 the presence or absence of dullness will depend upon the size of the effusion ; in Groups 2 and 3 they only vary from the usual signs of empyema by being somewhat low in position. In the majority of cases the cardiac displacement is a marked feature.

Radiologically, these conditions may be indistinguishable from subphrenic collections, but they can sometimes be diagnosed by lateral radiograms. The situation of the gastric gas-bubble may provide a diagnostic clue where the lesion is situated on the left side, and the introduction of air into the peritoneum

—pneumoperitoneum—may make the diagnosis clear on the right side. Diagnosis rests upon the above points associated with the findings on exploratory aspiration.

Treatment consists in drainage in one or two stages according as the parietal pleura is free or adherent and directly involved.

REFERENCES.—¹*Deut. Zeits. f. Chir.* 1934, May, 757; ²*Arch. méd.-chir. de l'App. resp.* 1933, viii, 280; ³*Ann. of Surg.* 1933, Oct., 520; ⁴*Surg. Gynecol. and Obst.* 1933, Aug., 156.

EMPHYEMA, TUBERCULOUS. (See TUBERCULOSIS, PULMONARY, SURGICAL TREATMENT.)

ENCEPHALITIS, EPIDEMIC.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Report issued by the Health Section of the League of Nations,¹ there was a decline in the incidence of epidemic encephalitis in 1933 in almost all the countries for which statistics are available with the exception of the United States, where H. S. Cumming² gives the following description of an epidemic. From July 1 to Oct. 1, 1933, 1029 cases with 187 deaths, or a mortality of 18 per cent, occurred in the district of St. Louis. Cases which had probably originated from the same source also broke out in other towns of Missouri and the neighbouring States. Apart from the usual predilection of the disease for males in the age group under 11, sexes and races were equally affected. The St. Louis epidemic resembled in some respects other epidemics of lethargic encephalitis, especially that in Japan in 1924, but differed from other epidemics in that the eye symptoms were much less frequent and that the meninges were always attacked. Recovery was also more rapid and complete. The lesions found post mortem were the same as those described in other epidemics of encephalitis, but were more diffuse in the brain and meninges, and showed no special localization in the basal ganglia and cerebral peduncles.

S. Rajchenbach³ states that from 1916 to 1925 several outbreaks of lethargic encephalitis took place in Poland, especially in the departments of Warsaw, Kielce, and Leopold. In contrast with Germany, Sweden, Austria, Great Britain, and Belgium, the fatality of lethargic encephalitis in Poland was rather low (19.3 per cent), and the Jewish population suffered most.

SYMPTOMS AND COMPLICATIONS.—A case of recurrent narcolepsy following lethargic encephalitis is reported by S. Koster⁴ in a man, aged 19. The attacks at first took place every month, but subsequently the intervals varied in length from three to fourteen months. The encephalitis had occurred five years previously. The remarkable features in the case were the long duration of the hypersomnia, which was never less than a week, the absence of any other symptoms of an organic lesion apart from a facial tic, and the consumption of considerable quantities of food during the periods of narcolepsy.

REFERENCES.—¹*Epid. Rep. Health Sect. League of Nat.* 1934, xiii, 1; ²*Bull. Off. internat. d'Hyg. publ.* 1933, xxv, 2127; ³*Thèse de Paris*, 1934, No. 194; ⁴*Nederl. Tijds. v. Geneesk.* 1934, lxxviii, 883.

ENCEPHALOGRAPHY. (See CEREBRAL PNEUMOGRAPHY.)

ENDOCRINE SYSTEM, INTEGRATION OF. (See also SEX HORMONES.)

Sir Walter Langdon-Brown, M.D., F.R.C.P.

For some years the pituitary has been recognized as the leader of the endocrine orchestra, and it is now fair to regard the diencephalon as its conductor. This aspect of the subject has been alluded to in recent volumes of the MEDICAL ANNUAL, and is again brought into prominence by H. H. Woollard's

demonstration of a direct anatomical connection between the cerebral cortex and the diencephalon, and by E. C. Dodds' Goulstonian Lectures.¹ These observations, combined with the remarks made at the discussion on suprarenal and pituitary tumours,² bring us perceptibly nearer to a realization of an integrated endocrine system, acting to a variable extent under the control of the emotional centres in the diencephalon.

Dodds classifies hormones under two headings. The first are complex protein bodies formed by the anterior pituitary which act on the other endocrine glands, causing them to form the secondary type of hormones, which are bodies of comparatively small molecular weight, most of which have been isolated in a crystalline form and some of which have actually been prepared synthetically. It will be noted that in this respect the posterior pituitary belongs to the second class.

The present-day view is that the anterior lobe of the pituitary produces the following hormones: (1) Growth hormone; (2) Prolan (whether a single substance or as two, A and B); (3) Thyrotropic hormone; (4) Pancreatotropic hormone; (5) Adrenotropic hormone; and (6) Parathyrotropic hormone. There is little new to record concerning the first of these.

Prolan is the first link between the pituitary gland and the sex organs. The study of the male sex hormone has been facilitated by: (a) The test of the growth of the comb and wattles in a capon following various transplantation and injection experiments, which is the equivalent of the vaginal smear test of Allen and Doisy for the female sex hormone; and (b) The discovery of the presence of the sex hormone in the urine of the male, in the same way as had previously been proved for the female. Butenandt has succeeded in isolating the former in a crystalline form by fractional distillation and has shown that it belongs to the same group as œstrin and the sterols. Girard has demonstrated the close relationship between these compounds and the bile acids. C. Kaupman proved at a meeting of the Royal Society of Medicine, on Feb. 13, 1934, that it is possible to produce a complete menstrual period in an ovariectomized woman and also to cause enlargement of the uterus in cases of infantilism by giving half to one million units of œstrin together with a small quantity of luteal hormone. Menopausal symptoms could be similarly treated. New methods of extraction have enabled the yield of œstrin to be quadrupled. Synthetic compounds resembling œstrin have been prepared, and the chemist can now manufacture what might be termed a skeleton key with which to open the œstrus lock. The real key is ketohydroxyœstrin, which is produced in the body. The skeleton key is dibenzanthracene, and by building up additional teeth, so to speak, the lock can be made to open with just as much ease as with one of the real keys provided by Nature.

All this throws doubt on the specificity of hormones. The significance of this to the organic chemist is great, since it may mean that it is not necessary to synthesize the whole of the elaborate molecules which occur in Nature, and that skeleton keys may be found for other hormones. The important factors seem to be a certain degree of unsaturation in a condensed carbon ring-compound with polar groups. Aschheim and Hohlweg, for instance, showed that products with very definite œstrogenic activity could be extracted from a wide variety of bituminous substances. That these substances are carcinogenic was already known, and now the Needhams and Waddington have shown that Spéman's organizer present in the dorsal lip of the blastopore of the embryo is not cellular but chemical in nature, and closely related chemically to œstrin. We see, then, a chemical affinity between vitamin D, œstrin, the male hormone, bile acids, carcinogenetic substances, and a substance determining the orderly growth of the embryo, in that they are all closely related

sterols. It would lead us too far from our present topic to show how teratomata have been explained by the release of this organizer at the wrong time or place. The fact that the actions of some of these substances are to a certain extent interchangeable has led Dodds to put forward the conception not only of skeleton keys but of pass keys which can open more than one hormonal lock.

The Thyrotropic Hormone.—The loss of the secretion of the anterior pituitary through disease or experimental extirpation is followed by atrophy of the thyroid with reduction of the basal metabolic rate, and these changes can be prevented by injection of an extract of the anterior pituitary. Moreover, the addition of such an extract to the fluid in which axolotls are kept initiates a metamorphosis which is preceded by a hyperplasia of the thyroid gland. Injections of the extract into guinea-pigs cause great hypertrophy of the parenchyma of the thyroid gland, with the production of exophthalmos and increased basal metabolic rate. We have here an experimental method of producing Graves' disease, and as in the case of Graves' disease the condition can be controlled by the administration of iodine. These effects cannot be produced in animals from which the thyroid has been removed. Such observations throw light on the emotional causation of hyperthyroidism. It has long been known that the thyroid gland has an abundant supply of sympathetic nerves, but as these appear to be purely vasomotor, and indeed vasoconstrictor, in action, it was difficult to see how their stimulation could lead to thyroid hypertrophy. Now we can fairly attribute such enlargement to excessive production of the thyrotropic hormone in the pituitary under diencephalic stimulation.

The Adrenotropic Hormone.—Removal of the pituitary leads to atrophy of the adrenal cortex, and it is interesting to recall that the premature senility resulting from atrophy of the anterior pituitary (Simmonds' disease) was for years attributed to adrenal cortical atrophy, which is now regarded as secondary to the pituitary disease.

The Parathyrotropic Hormone.—The osteoporosis and fractures which occur in Cushing's pituitary basophilism suggest that here, too, an influence may radiate from the pituitary to the parathyroids, even though significant changes in the level of blood calcium are generally absent.

Pituitary Basophilism and the Gonads.—Evans and Simpson some years ago maintained that the basophil cells in the anterior pituitary were responsible for sexual development, but some special problems in this connection have been raised by the syndrome attributed by Cushing to basophilic adenomas, which must be faced in any attempt at an integrated view of the endocrine system. H. H. Woollard³ urges that if the basophil cells are the source of the gonadotropic hormone it is unreasonable to suppose that virilism and decay of sexual function should follow excess of it. Injection of pituitary 'gonadotropic' hormone produces nothing like pituitary basophilism, but may produce gonadal atrophy. The term 'gonadotropic' seems singularly inappropriate in this connection. Woollard does not believe that the basophil cells are the source of the sex hormone. Rather, for the time at any rate, he envisages them as the inhibitors of the acidophilic activities. He thinks the evidence warrants the statement that the pituitary is indifferent to sex and plays no part in sexual differentiation, but exerts its effects on either the testis or the ovary, bringing each to its structural differentiation and to its full endocrine activity. The initial bias in sex differentiation rests undoubtedly on the chromosomal constitution, the male carrying the inert chromosome in mammals, the female in birds. In insects the chromosomal constitution is the sole and efficient cause of sex differentiation, but in birds and mammals

the effect is slight and has to be reinforced by the endocrine activity proper to each sex. Indeed, before this time is reached the influence of the chromosomes seems so weak that the developing embryo passes through an indifferent phase when no anatomical feature is yet present to distinguish the sexes. Rather is the embryo bisexual, for structures proper to both male and female come into being. This period is followed by a brief interval when a masculinizing tendency apparently occurs in both sexes. In the female this shows itself by producing a medullary mass in the gonad, which is really a testis, and in the male actually becomes the testis. In the female it lives on as a testicular rudiment in the rete of the ovary, the real ovary coming from a superficial investing cortex. The masculinizing tendency common to both sexes is seen in another fact—namely, the earlier differentiation of the testis. This comes to be a recognizable gonad at an earlier period than the ovary. It follows from this that the testis is a monosexual organ, while the ovary is a bisexual organ, every ovary containing a rudiment of the testis. Therefore, sex reversal can only occur in the female—a deduction with which all experience concurs. The gonadic territory in the embryo consists, in the first instance, of a genital ridge which lies on the medial side of the mesonephric mass. It is certain that sex-reversal is caused by an abnormal growth of mesonephric derivatives which are regularly present and are to be found in the rete of the ovary and the cortex of the adrenal. In the male all the mesonephric structures, except the Müllerian duct, not only survive but develop further. In the female the further growth of all these structures, except the Müllerian duct, must be inhibited. This means a very great mass of tissue has a masculine tendency, and makes intelligible the generalization that sex reversal proceeds from the abnormal growth of mesonephric remnants normally present. In this way Woollard explains the virilism caused either by the inhibitory effect of a basophilic adenoma or by the counteracting effect of an excess of adrenal cortex on the feminizing tissues. As will be seen in the article on the ADRENAL GLANDS, Levy Simpson has come to a closely similar conclusion concerning the function of the basophil cells.

These new conceptions are leading to a much clearer view of an integrated endocrine system. First came the realization of the close association between the pituitary and the emotional centres in the diencephalon; then the generalization that polyglandular syndromes were most usually based primarily on a pituitary lesion. Next there was the discussion as to prolan—whether there were two substances, one stimulating the production of oestrin, the other stimulating the luteal hormone. Opinion has veered to the conclusion that there is only one prolan, which can speed up the ovary in either direction according to the phase of the menstrual cycle on which it acts. Collip regards the prolan-like substance found in placenta and urine as requiring activation by the pituitary. Then it was found that practically all the other endocrine glands could be influenced by some hormone formed by the anterior pituitary, until the number of such hormones required became positively alarming. This newer conception of the anterior pituitary producing an accelerating hormone in the eosinophil cells and an inhibitory one in the basophil cells seems much more rational—the functions and the staining reactions of these cells being alike diametrically opposed. One may regard, then, the anterior pituitary as largely controlled by the diencephalon and putting down the loud or soft pedal, as it were, on the other glands.

Two analogous cases occur to the mind. In earlier days the number of 'centres' located by the physiologist in the medulla around the fourth ventricle multiplied until they produced a revolt against the whole conception. That centres should exist ready-made for a contingency which might never arise

throughout life was a *reductio ad absurdum*. In the same way the functions controlled by the anterior pituitary have multiplied until the existence of a separate hormone for each function has become almost incredible, even though Collip has isolated the growth hormone and the thyrotropic one by fractionation⁴. The second analogy by which it may not be inappropriate to illustrate this theory of pituitary behaviour is H. H. Dale's work on cholinergic and adrenergic nerve-fibres, which has completed the earlier work of T. R. Elliot and of Loewi. All preganglionic endings of whatever function when stimulated liberate acetylcholin. So do all post-ganglionic endings except those of the sympathetic system, which liberate adrenalin instead, the adrenal medulla, which represents the post-ganglionic element, liberating it in larger amounts. These chemically active bodies excite the 'receptive substance' in the tissue to which the nerves are distributed. The case for nervous impulses acting through the intermediary of a chemical reaction is therefore proven. It is accordingly by no means fanciful to regard the anterior pituitary as receiving the impulses from the diencephalon, and producing an activating and an inhibitory hormone of a protein character according to demand, which can speed up or inhibit the secretion of the simpler grade of hormone in the other endocrine glands—hormones which are of allied chemical structure and which, in some instances, may even be interchangeable in their effects. At any rate, it is a unifying hypothesis which deserves further and careful consideration.

(See also PITUITARY BODY.)

REFERENCES.—¹*Lancet*, 1934, i, May 5, 931, May 12, 987, May 19, 1048; ²*Proc. Roy. Soc. Med.* 1934, xxvii, Jan., 271; ³*Ibid.*; ⁴*Lancet*, 1933, i, June 3, 1208.

ENTERIC FEVER. (See PARATYPHOID FEVERS; TYPHOID FEVER.)

EPIDERMOPHYTOSIS. (See SKIN, FUNGUS INFECTIONS OF.)

EPILEPSY. (See also CYSTICERCUS EPILEPSY; HYPOGLYCAEMIA AND HYPER-INSULINISM; MIGRAINE.) *Macdonald Critchley, M.D., F.R.C.P.*

Reflex Epilepsy.—It is well-known that a number of epileptic patients are able, at times, to inhibit the development of an oncoming attack. Provided that the aura is sufficiently prolonged, or the premonitory symptoms definite enough, the patient may be able to avert the oncoming unconsciousness by carrying out some individual trick. Thus, by exercising a strong effort of will, by walking about, or by sitting down and resting, or by making excessive muscular contractions, inhibition may be secured. Sometimes drinking copious draughts of water will be effective.

The reverse phenomenon is very much rarer among epileptics. We know, of course, that various environmental or personal factors are often capable of aggravating the course of an epilepsy. Thus most epileptic patients are aggravated by such psychological factors as fear, excitement, and, to a greater extent, boredom. It is the experience of nurses at epileptic colonies that a patient put to an uncongenial task will have more fits than usual. Inter-current maladies of a minor type also aggravate, whereas severer illnesses such as pneumonia and diphtheria produce a temporary immunity. This is particularly noticeable during epidemics of influenza. Gastro-intestinal disorders—such as constipation, diarrhoea, gastralgia, and the effects of over-eating and inebriety—have a deleterious influence. The menstrual period is a common aggravating factor, whereas pregnancy has an inhibitory effect. Occasionally, epileptics are susceptible to the weather, being better in dry and sunny weather, hot or cold, and worse in extreme heat, damp, closeness, and storms. States of acidosis on the whole tend to improve the epileptic, while an alkalosis

aggravates. Finally, one may refer to the factors of sleep, and the time of day, as often influencing the periodicity of epileptic attacks.

None of the foregoing circumstances, however, constitutes more than a factor which is broadly favourable or unfavourable. Immediate precipitation of an attack does not occur, and it is very exceptional for an epileptic to be able to produce a fit at will. There are, however, three measures which are often capable of immediately causing an attack in an epileptic subject. These procedures are: (1) An injection of cocaine; (2) The production of alkalosis by over-ventilation of the lungs; and (3) Manual stimulation of the carotid sinus. At times also a fit may be brought about by inducing light ether or nitrous-oxide anaesthesia.

The term 'reflex epilepsy' is applied to those very exceptional cases where fits immediately follow some definite precipitating factor, which usually takes the form of a sensory stimulus. In some cases of reflex epilepsy, no fit occurs without the necessary stimulus. More often, however, the patient also suffers occasional attacks without the appropriate trigger being pulled. Occasionally, too, the stimulus may be present, but no fit follows. Much depends upon the nature of the reflexogenous stimulus and the circumstances under which it is applied.

The epileptic attack itself may be focal or generalized. Thus the reflexogenous stimulus may produce nothing further than a spasm or an outburst of twitching confined to a limb. It is interesting to notice how often the effective stimulus in such cases resembles an aura. For example, a patient may be subject to attacks preceded by tingling or pain in one hand; when one stimulates the particular body-segment with a pinprick, a fit may immediately succeed.

M. Critchley,¹ in a recent study of reflex epilepsy, groups the various clinical varieties according to the nature of the effective stimulus.

Tactile factors may be responsible. A sudden touch or blow may be followed by unconsciousness. The contact need not necessarily be heavy, but as a rule it must be entirely unexpected. A variety of tactile stimulus is seen in those cases where scratching or tickling the soles of the feet may be followed by unconsciousness with convulsion. In cases of Jacksonian epilepsy associated with local cerebral disorder, it is not very rare for an attack to be produced by over-stimulation of the segment wherein the movements usually commence. The older literature also holds a number of examples where a painful peripheral focus of disease has been present, aggravation or stimulation of which provokes a generalized convulsion. Thus an epileptic who had sustained a gunshot wound of the sciatic nerve was liable to have an attack when the scar was handled or the sciatic nerve stretched. Whether or not one should include the well-known 'pleural epilepsy' among the group of tactile reflex epilepsy is conjectural.

Auditory stimuli play a rôle in the second largest group of cases of reflex epilepsy. Actually there are two subgroups of these cases of so-called 'acustico-motor epilepsy'. In the former, an epileptic attack, local or general, follows a sudden unexpected noise. Here again—as in most of the tactile cases—the element of surprise is all-important. The second subtype is much more complex. Here, the factor of startle plays little or no part, the effective stimulus being music. Only a comparatively few such cases of 'musicolepsia' have been recorded, but a description by the Russian novelist Nikonov (himself a sufferer from this rare malady) entitled "Fear of Music" gives an admirable account.

Visual stimuli are at times operative in cases of reflex epilepsy. Thus epileptic attacks have been known to be provoked by gazing at bright sunlight

or at dazzling electric lamps. In affections of the occipital lobe followed by visual epilepsy it has been observed that the fits were sometimes precipitated by optical stimulation. Thus Holmes remarked that soldiers with wounds of the occipital region were apt to develop an increased number of epileptic attacks after they had been straining their eyes at a cinema.

There are yet a number of still rarer types of reflex epilepsy, where the stimulus has been of olfactory or gustatory nature, or where the precipitating factors have comprised such complicated somatic activities as laughter, sexual intercourse, defaecation, and micturition.

Lastly, one may refer to the affective types of reflex epilepsy, where a fit immediately follows some sudden emotion, of which fright is the most frequent instance.

Despite their great rarity, cases of reflex epilepsy are of the utmost importance in that they promise to throw some light upon the problem of epilepsy itself, and upon the nature of the pathogenetic factors.

Use of Barbiturates.—R. Handley³ has set out his personal experiences in the treatment of epileptics with various barbiturate preparations at the David Lewis Colony. The main conclusions are well worth summarizing. According to his opinion 'Rutonal' (methyl-phenobarbital) is somewhat slow in action and requires doses of 5 to 10 gr. in order to secure an anti-epileptic effect. He himself has had no personal experience with the drug. In order to compare the effect of luminal with that of phenobarbitone, 200 patients of both sexes were suddenly taken off luminal sodium and given soluble phenobarbitone; these cases were then compared with 200 others who continued to take luminal sodium. No one, except the author, knew of this change-over. This test was continued for four months. No immediate ill effects were noted either in the nature of rashes, nausea, or psychological changes. The frequency and rhythm of the epileptic attacks did not alter at all in the cases given phenobarbitone. [This experience agrees with that of the reviewer in the Out-patient Department of the National Hospital, Queen Square.—M. C.] The author emphasizes the advantages of employing phenobarbitone, in that it is a British drug, purchasable in bulk, and much cheaper than luminal. Prominal has been used by the author in a few patients only, the series being too small to give conclusive results.

The author states that the hypnotic dose of luminal is above 5 gr. [Certainly much smaller doses can be advantageously employed in cases of sleeplessness.—M. C.]. Anti-epileptic doses are usually 2 gr.; this amount may cause some drowsiness for the first ten days or so.

At the David Lewis Colony treatment is instituted with 2 gr. of soluble phenobarbitone, dissolved in $\frac{1}{2}$ oz. of water and given each morning. At the end of two weeks any nausea or sleeplessness should have disappeared. Each case is reviewed at the end of a month, and appropriate alterations are made. Such may comprise :—

1. Phenobarbitone may be stopped at the end of six months if no change has been produced or is to be expected.

2. If the drug has improved the patient, then it may be increased from 2 to 3 gr. (N.B.—The author does not mention the advisability of ever *reducing* the initial tentative dose of luminal.)

3. The time of giving the drug may be altered.

4. The daily dose may be divided into two doses each of 1 gr. This measure is specially useful in cases of petit mal occurring in the evening.

5. Bromide may be prescribed in addition to the luminal. The author states that he has found this a useful expedient in allaying headache and nausea after major attacks.

Handley makes a rule when prescribing phenobarbitone for out-patients never to give more than eight days' medicine. Experience at neurological hospitals scarcely seems to justify this restriction.

In cases of *serial epilepsy*, where fits occur in clusters, but with return of consciousness between each attack, Handley finds that regular phenobarbitone medication is most efficacious. A dose of this drug given at the commencement of a bout seems to have no effect in aborting the series, however. A rectal wash-out and the administration of 30 gr. of chloral is the best method of cutting short such a series of attacks.

Cases of *status epilepticus* are rare since the introduction of phenobarbitone treatment. Again, the best treatment for status is not phenobarbitone given by injection or per rectum, but rectal lavage followed by the administration of chloral and a solution of glucose by mouth. (An interesting account of the experience of the Lingfield Colony in the treatment of status epilepticus was given in the *MEDICAL ANNUAL* for 1934, p. 169).

Handley confirms the usual neurological opinion as to the safety of continuing phenobarbitone administration over long periods. In 1933 over 400 patients were taking this drug regularly; some of them had taken it daily for more than twelve years. The senior store-keeper of the Colony, an epileptic aged 63, has taken a daily dose of phenobarbitone for eleven years without showing any sign of mental deterioration, being bright, astute, and trustworthy. His assistant, aged 36, has taken 2 gr. of phenobarbitone daily for over twelve years. He is above average intelligence and his friends say he is definitely brighter than he was twelve years ago. Other cases can be quoted to illustrate the integrity, if not the improvement, of mental capacity in epileptics taking regular doses of phenobarbitone over very long periods.

The usual teaching warns one against the abrupt withdrawal of phenobarbitone on account of the danger of precipitating status epilepticus. Experience at the David Lewis Colony has not confirmed this.

The author has no knowledge of a single case of phenobarbitone addiction in an epileptic. No instance of luminal skin rash has been observed. He wonders whether this freedom may not be due to the use of soluble phenobarbitone which is alkaline. Morning sleepiness is often complained of when phenobarbitone is first used, but it does not last more than a fortnight. Wildness and excitement have been observed in a few patients, but these had all been abnormal mentally before the drug was started. Two patients complained that the first few doses provoked nausea, but this did not appear after about the third dose.

(See also POISONING.)

REFERENCES.—¹*L.C.C. Annual Report*, 1934; ²*Jour. of Ment. Sci.* 1934, lxxx, 526.

ERYSIPELAS. (See also SKIN, PYOGENIC INFECTIONS OF.)

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—E. Cachera-Magrah,¹ who reports 11 cases in children aged from 3 days to 3 months, of which 10 were fatal, states that *erysipelas in the first three months of life* presents a special clinical picture like many other infections at that age. Erysipelas of the umbilicus is not the only form of the disease then encountered, but the portal of entry for infection may be any point on the skin surface. The characteristic features of erysipelas during the first three months of life are the ambulatory and sometimes erratic character of the erysipelatous patch, the marked tendency of the patch to become generalized and sometimes confluent, and the almost constant presence of streptococcal septicæmia. Erysipelas in the newborn is particularly serious, probably owing to the lack of the ordinary modes of systemic defence at this

age. For the same reason the likelihood of successful treatment even with specific serum is much reduced.

TREATMENT.—H. Grauer² recommends the use of a 4 per cent solution of silver nitrate as a simple, almost painless, and very successful method for the treatment of erysipelas in the newborn. The erysipelatos lesion with the surrounding area is swabbed four-hourly day and night with the solution. After three days' treatment the erysipelas usually tends to subside, and the average duration of cases so treated is twenty-one days.

L. M. Nightingale and S. Starr³ treated 51 cases in children under 12 years of age, 12 of whom were under a year old, by *ultra-violet rays*, and found that the results were better than those obtained by serum therapy. The earlier the applications were made, the better the results. There was no difference in severity observed between the facial and the body type of erysipelas, except that the genital type was usually severe. The mortality was almost nil among previously healthy children over 2 years of age, and death when it occurred was due to complications such as mongolism, pneumonia, and so on.

REFERENCES.—¹*Thèse de Paris*, 1933, No. 200; ²*Ibid.* No. 564; ³*Jour. Amer. Med. Assoc.* 1934, cii, 761.

ERYTHEMA INFECTIOSUM.

J. D. Rolleston, M.D., F.R.C.P.

J. Zikowsky¹ records a big epidemic which occurred in Vienna in 1930, when 79 cases were admitted to the Franz Josef Hospital alone. The outbreak commenced in January, reached its height in February and March, and came to an end in June. Most of the patients were between the ages of 4 and 10, and only four were over 14. Of the 79 patients, 48 were girls and 31 boys. The disease in every case ran its usual mild course and there were no complications or sequelæ. The blood showed a considerable eosinophilia, which in one case reached 19 per cent. The total number of white cells was normal or only slightly increased.

An epidemic of 124 cases which occurred between May and August, 1933, at Ivrea (North Italy) is recorded by M. Abbate.² The patients' ages ranged from 1 to 11 years, but only 17 were under 6 years, and the great majority were between 6 and 8 years. The epidemic was almost confined to the central part of the town, and showed no tendency to spread to the neighbouring country. The disease was of the ordinary mild type, and only 5 patients showed any fever. Changes in the leucocyte count were not constant, but lymphocytosis was the most frequent finding.

REFERENCES.—¹*Wien. klin. Woch.* 1933, xlvii, 843; ²*Pediatrics*, 1934, xlii, 374.

ERYTHEMA NODOSUM.

Reginald Miller, M.D., F.R.C.P.

The frequency with which cases of erythema nodosum are referred to hospital unrecognized as such by the practitioner, is peculiar, for in the great majority of instances there is no disease more easily diagnosed.

The disease, perhaps more common in the spring than at other times of the year, usually develops fairly abruptly with fever, pains in the limbs and joints, but without joint swellings. In some instances an initial sore throat is present. After a variable number of days the rash appears, and this is most characteristic in its appearance and still more so in its distribution. The skin lesions consist of purpuric nodes which are at first painful, tender, and red, and as they fade they go through the colourings of a bruise. They appear chiefly on the shins, from the level of the ankle up to about three inches above the knee; and on the extensor aspects of the forearms, from the wrist up to just above the elbow. If the rash is more extensive, typical nodes may be found elsewhere, particularly on the buttocks and face. As the rash appears, the

fever begins to lessen. Fresh crops of nodes may appear, and this is particularly likely to occur when the patient is allowed up again. The disease is therefore an easily recognized infective disorder, at the time harmless enough, but sometimes annoying by reason of its tendency to relapse.

TREATMENT.—Apart from rest in bed, there are no measures by which the course of erythema nodosum can be controlled. In the horizontal position the pain in the legs is considerably eased within twenty-four hours. In addition, the weight of the bedclothes may be taken off the legs by means of a bed-cradle, glycerin and belladonna may be applied to the rash, and such analgesics as aspirin may be given. Once the pain has gone, no treatment is required save rest in bed until the temperature has been normal for a week. The recurrence of the rash and fever on getting up has already been mentioned as a possibility, and emphasizes the fact that rest in the horizontal position in bed seems to control this disease better than any other measure.

ETIOLOGY.—At the present time the chief interest in the disease concerns its etiology. Various hypotheses have been put forward at different times, and in the last few years this question has attracted much attention.

Rheumatic Infection.—Owing, it may be supposed, to the presence of fever with muscular pains and arthralgias in erythema nodosum, it was at one time held that the disease should be included as a symptom of rheumatism. It is quite thirty years ago that David Lees taught that this was untrue, and no authority on juvenile rheumatism would allow now that erythema nodosum was essentially a rheumatic manifestation. Perhaps some authorities would still hold that rheumatism is one of the infections which may exceptionally cause erythema nodosum, but none would regard erythema nodosum as in itself evidence of rheumatic infection. The same may be said of the so-called peliosis rheumatica, another purpuric disorder. Many facts might be given to prove that both these diseases are outside the picture of true rheumatic infection. To give only one argument: in true juvenile rheumatism hæmorrhagic lesions are rare and denote extremely severe infection, whereas in erythema nodosum and peliosis rheumatica the purpura is the essence of the disease and the so-called rheumatic symptoms are at a minimum.

Specific Infection.—A. E. Lendon,¹ working in Australia, in 1905 published a small book on what he called 'nodal fever', promulgating the view that erythema nodosum is an acute specific fever and due to a specific infection. This hypothesis has much to recommend it, notably the appearance of the disease in small outbreaks in school where it apparently bred true, and has been supported by J. O. Symes² and others in this country.

Varied Infections.—An alternative view is to the effect that erythema nodosum may be set up by various infecting agents. Streptococcal throat infections seem clearly able to produce the disease, and much depends on whether it may also be associated in some way with tuberculous infection. If so, and opinion seems to be veering in this direction, there would seem to be two main groups of the disease, one due to the hæmolytic streptococcus and the other to tuberculosis.

Tuberculous Infection.—This view has been put forward in recent years by Continental authors, particularly A. Wallgren³ and H. Ernberg,⁴ who have pointed out the frequency in this disease of positive tuberculin tests, positive radiological evidence of hilar tuberculosis, positive tests for tubercle bacilli with gastric lavage, and so on. What the exact relationship between erythema nodosum and tuberculosis may be is rather difficult to understand. It is thought that the infection arises during a time when the patient is hypersensitive to tuberculous infection.

W. R. F. Collis⁵ discusses this problem, and concludes that "erythema

nodosum is a type of hyperactive tissue response to different bacterial allergens, and that the allergens responsible for the disease in London are commonly tuberculin and hæmolytic streptococcal endotoxin." Testing his cases of erythema nodosum in various ways to distinguish between the two groups, he states that in London he found 71 per cent to be tuberculous and 18.4 per cent to be streptococcal, while in the rest the type of infection could not be determined. In a further series of cases examined in Dublin he finds 90 per cent to be tuberculous and 10 per cent streptococcal.

REFERENCES.—¹*Nodal Fever*, 1905; ²*Erythema Nodosum*, 1928; ³*Handb. d. Kinder-tuberk.* 1930, i, 809; ⁴*Jahrb. f. Kinderheilk.* 1921, 951; ⁵*Brit. Med. Jour.* 1933, ii, 1162.

J. D. Rolleston, M.D., F.R.C.P.

ETIOLOGY.—According to P. Guinard,¹ erythema nodosum is usually only a syndrome due to various infective or toxic causes, the chief of which are tuberculosis and syphilis. The former is by far the most frequent cause, so that in every case of erythema nodosum a careful inquiry should be made into the history, and a clinical and radiological examination for tuberculous lesions should be carried out. Some authorities regard erythema nodosum as a primary tuberculous infection due to the ultra virus, which accounts for the appearance of tuberculous lesions in the course of the disease, the absence of tubercle bacilli, and the rarity of erythema nodosum in ordinary cases of tuberculosis. Syphilitic erythema nodosum does occur, but is much rarer. It usually appears in the secondary stage in severe attacks of syphilis. Erythema nodosum may also develop in the course of other infections such as diphtheria, septicæmia, or tonsillitis. Lastly, in some cases, erythema nodosum appears to be a primary specific autonomous disease which may occur in epidemic form.

M. Gibert² records 17 cases of erythema nodosum in children aged from 19 months to 14 years in whom clinical and radiological examinations were in favour of a tuberculous etiology, although other factors could not be excluded.

P. Evreniades³ reports 9 cases in patients aged from 17 to 37 in whom erythema nodosum appeared in the course of secondary or tertiary syphilis. He points out, however, that the coexistence of the two conditions does not prove the syphilitic origin of erythema nodosum, but merely indicates that the unknown pathogenic agent of erythema nodosum has been activated either by syphilis itself or by antisyphilitic treatment.

REFERENCES.—¹*Thèse de Paris*, 1933, No. 615; ²*Ibid.* No. 614; ³*Ibid.* 1934, No. 110.

ERYTHREMIA. (See BLOOD DISEASES.)

EUNUCHS AND HERMAPHRODITES.

Hamilton Bailey, F.R.C.S.

Eunuchs.—Bulls that are castrated lose their fiery spirit, but are not deprived of their fitness for labour; dogs, likewise, cease to desert their masters, but are not less fitted for watching or the chase; and men, also, by being deprived of desire, become more gentle, but are not worse horsemen nor less able to throw the javelin (Xenophon).

Through the ages there have been eunuchs. Many have been conscripted from the sons of the vanquished. Their commercial value was low unless they had been deprived of all their male attributes. Even down to our own times, demasculation was conducted brutally and carried a mortality of 80 per cent. Latter-day eunuchs were mostly little Nubian boys, bought, mutilated, and sold by priests of the Coptic monasteries. The penis and testes were excised without any form of anaesthesia. Bleeding was stanchied by the application of boiling oil. The boy was then placed standing in a pit full of sand, and in

the few survivors the wound healed. The majority of the victims suffered from post-operative urethral stricture with its inevitable train of chronic ill health.

With the winds of fortune so set against him, it is almost inconceivable that a eunuch could overcome his psychological and physical disadvantages, gain esteem, and attain a position of respect. Nevertheless, many eunuchs have lived to an advanced age and some have occupied positions of great importance. To quote two only: Narses was a distinguished general, and Hermias became the Governor of a province in Asia Minor.

Eunuchs were in power in the Roman Empire during its decline, and they have been held responsible, notably by Gibbon, for the evils which permeated the Byzantine court. T. E. Hammond¹ considers this unfair, and suggests that the eunuchs' rise to power was rather a sign that they were less engrossed in the debauchery and licentiousness which enfeebled their compatriots. At any rate, history reveals that it is possible for a man without testes to become a leader and a senex. This is hardly in keeping with the trend of teaching of modern endocrinologists, who imply that testes make the man, and lack of testicular internal secretion precipitates senility.

T. E. Hammond has studied the lives of seven men castrated during manhood for bilateral testicular tuberculosis. Soon after castration the majority experienced increased sexual desire, due, it is thought, to irritation of the spermatic nerves. Later, desire decreased, but the majority of these patients were not impotent. Most of them put on weight. There was no change in the voice, no waning of mental activity, nor impairment of physical strength attributable to removal of the testes. Shaving had to be carried out less often.

(See also SEX HORMONES.)

Hermaphrodites.—In the world's literature there are on record but twelve true hermaphrodites. By a true hermaphrodite is meant an individual possessing both an ovary and a testis. Pseudo-hermaphrodites are fairly common, and it is often exceedingly difficult to be certain to which sex the patient belongs. In describing thirteen examples he has met with in practice, H. H. Young² recounts their life histories. A few of them were actually bisexual in their physical relations, sometimes functioning as a male and sometimes as a female. Professor Young shows how the aid of surgery can be invoked to establish a definite sex for these patients.

REFERENCES.—¹*Brit. Jour. Urol.* 1934, June, 128; ²*New Eng. Jour. Med.* 1933 Aug. 24.

EVIDENCE OF LIVE BIRTH. G. E. Oates, M.D., M.R.C.P., D.P.H.

Sydney Smith¹ states that if a child has not breathed the stomach and intestines contain no air. Using X rays M. Hajkis² has been unable to demonstrate air in the stomach or intestines of stillborn children, even when a large quantity of meconium has been passed. He also supports Smith's view that the presence of air in the stomach and bowel is a useful confirmatory sign of respiration, especially in cases where the lung has not been expanded either from weakness of the respiratory movement or from blocking of the respiratory passages. In such cases, he says, air may still be swallowed, and from its presence in the stomach and bowel afford evidence of attempted respiration. Of the three essentials in the establishment of life—namely, the action of the heart, respiration, and deglutition and peristalsis—full respiration is the most difficult to establish fully. Respiration appears to be impossible without deglutition and peristalsis, and in the infant, as in the adult, asphyxia exaggerates peristalsis and so encourages the movement of any air that enters the intestinal tract. In the author's opinion radiography of the lungs and intestinal tract provides

the best proof of live birth. The possibility that gas may be produced by putrefaction in lungs or intestine must be borne in mind; but the bubbles arising in this way would give an appearance different from that of air-filled alveoli, or bowel which has been aerated by peristalsis.

When the dead body of a newly born infant found in a waterway is the subject of medico-legal examination the first point to be dealt with is: Was the infant born alive? The answer to this question depends upon the state of maturity of the infant, the volume and colour of the lungs, the flotation test, the contents of the stomach, etc. On the Continent, however, great importance is laid on the contents of the bowel below the pylorus. F. W. Martin³ quotes Continental opinion on this point. One observer immersed the bodies of stillborn infants in water for from seven to forty-three hours, and in no instance did he observe any of the water below the pylorus. Another observer dealt with 24 cases in which he removed the stomach and filled it under pressure with coloured water. In no case could the water be caused to pass the pylorus. It would appear that if water or any foreign material from the waterway be found below the pylorus it is definite evidence of live birth.

REFERENCES.—¹*Forensic Medicine*, 1931, London; ²*Lancet*, 1934, July 21, 134; ³*Brit. Med. Jour.* 1934, July 21, 134.

EXANTHEMA SUBITUM.

J. D. Rolleston, M.D., F.R.C.P.

M. Abb¹ reviews the literature of the condition named roseola infantilis by Zahorsky in 1913 and exanthema subitum by Veeder and Hempelmann in 1921, which has been described in the United States, Hungary, Germany, Switzerland, and elsewhere as an independent disease. Abb, however, from observations in Rietschel's Clinic at Würzburg maintains that it is not a disease *sui generis* but an influenzal infection in which the exanthem represents an allergic reaction. The final settlement of the question must be left to the bacteriologist.

REFERENCE.—¹*Zeits. f. Kinderheilk.* 1933, lv, 339.

EYE AFFECTIONS. (See CONJUNCTIVA; CORNEA; CORNEAL CONTACT GLASSES; GLAUCOMA; HEADACHES OF PITUITARY ORIGIN; PTOSIS; RETINA, DETACHMENT OF; SCLEROMALACIA PERFORANS; SQUINT.)

FIFTH DISEASE. (See ERYTHEMA INFECTIONOSUM.)

FILARIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Further studies of the distribution of filariasis in India by V. T. Korke¹ showed no infections among the jail population of the very dry Sind area, but in Gwalior State in Central India, at an elevation of 500 to 1000 feet, an infection rate of up to 16 per cent was met with. Cutaneous onchocerciasis in a Simulium-infested region to the north of Lake Victoria in Uganda has been studied by E. G. Gibbins and L. J. A. Loewenthal.² All stages from papulo-pustular to generalized lichenification and a true pachydermia were met with in which dissection revealed adult nematodes. Dissections of *Simulium damnosum* revealed infections in as many as 14 per cent, and huge tracts of fertile country are rendered uninhabitable by this fly, which makes life miserable by the irritation its bites induce.

The filarial intradermal skin test has been carried out by E. G. Sayers³ in cases of tropical myositis and muscle abscess in the British Solomon Islands with only one positive reaction; this is against the theory that this condition is a complication of filarial infection. C. A. Lane⁴ records two cases of filariasis in which lymphatic glands containing adult filariæ were excised before noon and were found to contain numerous microfilariae. In one case the number

of embryo worms in the peripheral circulation was found to be increased for a time after the removal of the adult worms, and the glands contained a few ova and a number of degenerating embryos.

TREATMENT.—*X-ray treatment* of chyluria and filarial lymphangitis is reported on by R. Golden and F. W. O'Connor,⁵ with a strength of 180 to 200 K.V., 50 cm. target-skin distance, and 0.5 mm. of copper filter, at intervals of one to two weeks. In 9 cases of chyluria only 7 had completed the treatment of one or more series of four sittings with intervals of one to two months, and in 4 recurrences had taken place, 2 remained well for fifteen months and three years respectively, and 1 had been killed accidentally, so no conclusions are drawn. Fifteen cases of filarial lymphangitis and adenitis were also treated and followed up for from eight months to three-and-a-half years, and 8 are considered to be improved to a greater or less degree, so they think the method worthy of further trial.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1933, Oct., 437, and 1934, Jan., 569; ²*Ann. Trop. Med. and Parasitol.* 1933, Dec. 20, 489; ³*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, March 12, 507; ⁴*Lancet*, 1933, Aug. 19, 399; ⁵*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, Jan. 31, 385.

FISTULÆ. (See CYSTS AND FISTULÆ.)

FOOD AND THE PUBLIC HEALTH.

G. E. Oates, M.D., M.R.C.P., D.P.H.

Energy Requirements of Diet.—Towards the end of 1933 a Committee was appointed by the Council of the British Medical Association to determine the minimum weekly expenditure on foodstuffs which must be incurred by families of varying size if health and working capacity are to be maintained. This Committee proposed an energy value of 3400 calories per man per day as a safe figure for the daily energy requirement of a man of average stature leading a healthy life with moderate muscular exertion, and also suggested that the diet should supply 50 grm. of first-class protein. This standard appeared to be inconsistent with that propounded by the Ministry of Health's Advisory Committee on Nutrition, which stated that the energy value in calories of the diet per 'man' per day should total 3000 or thereabouts, and that the diet should supply about 37 grm. of first-class protein. Subsequent consultations between the specialists concerned revealed the fact that there was really no fundamental disagreement on matters of importance. The standard to be laid down depends upon whether the 'man' to be considered is an adult man or an average member of the population. It was decided finally that the all-round average requirements of the entire population, or of large mixed groups of people, at the present time is about 3000 calories a day. This figure can be safely employed for calculation of mass requirements, but would not necessarily be applicable to individuals or single families whose conditions of life might justify a divergence from the average food requirements.

Dysentery Bacilli as a Cause of Food Poisoning.—Dysentery, often of a mild type, is probably much more prevalent in this country than is commonly supposed. It is only lately that it has been recognized that dysentery bacilli may be the cause of acute attacks of illness of food-poisoning type which are almost identical in clinical manifestations and epidemiological features with ordinary salmonella food-poisoning outbreaks. Dysentery bacilli of the Sonne type are reported¹ to have been responsible for an outbreak of food poisoning in St. Pancras and Holborn. There were 10 cases, with 2 deaths. The clinical symptoms were those ordinarily associated with food poisoning—namely, vomiting and acute abdominal pain—and there was also passage of blood and mucus in the stools and a high temperature in some cases. The vehicle of

infection was pease pudding made from dried peas, boiled with some sodium bicarbonate in a saucepan. There was no doubt that the dysentery bacilli were absent in the dried peas but were introduced into the pease pudding. The investigations showed that a little girl had been a carrier of the bacilli for some time, and that she was the probable source of infection. This child took some pease pudding and apparently dipped her fingers into it when taking it from the dish in which it was contained. The presence of blood and mucus in the stools—features somewhat uncommon in salmonella food poisoning—is a useful pointer to the diagnosis of dysentery. If this condition is suspected, special care must be taken to include the large as well as the small intestine in the portions selected for examination at a post mortem. In specimens sent for bacteriological examination dysentery bacilli may easily be overlooked unless the possibility of their presence is borne in mind.

Gastric Digestion of Milk in Infants.—There is still much discussion on the relative digestibility of boiled and unboiled cow's milk. The results of past experiments have been conflicting, and in any case the results of *in vitro* experiments must be applied with caution to the course of digestion in the living subject where the conditions are clearly different, for in these the amount and composition of the gastric secretion may be altered in response to different types of food. For the purpose of settling the controversy J. W. Ogilvie and O. D. Peden² describe their observations on the gastric contents of infants which were removed before and at half-hourly intervals after test-feeds of raw and boiled milk. They used as indices of the course of digestion, the amount of free hydrochloric acid and total chlorine and the degree of total acidity; the peptic activity; the soluble non-protein nitrogen; and the soluble calcium. In the majority of cases the stomach was over two hours in emptying with both types of milk, which confirms the findings of L. Wills and D. Paterson,³ who state that the stomach empties in two and a half hours in artificially fed infants. The authors were able to demonstrate clearly that there is no significant difference in the gastric digestion of boiled and raw milk, and it may certainly be concluded from their experiments that the digestibility of milk is not adversely affected by boiling.

REFERENCES.—¹*Lancet*, 1933, Nov. 4, 1068; ²*Ibid.* 1934, July 14, 76; ³*Arch. of Dis. in Childh.*, 1926, i, 232.

FRACTURES.

E. W. Hey Groves, M.S., F.R.C.S.
K. H. Pridie, F.R.C.S.

The great advance in traumatic surgery during the last few years has been the adoption of the principles and methods of Lorenz Böhler of the Accident Hospital in Vienna. His new book on the treatment of fractures¹ has been translated into English and recently published. In this work he emphasizes the following points:—

At last it is being realized that the organized treatment of fractures is of vital importance to the community, and that these injuries should no longer be left to junior house-surgeons to treat. There is probably no branch of surgery where the difference between efficient and inefficient treatment is so marked—for instance, a man with a simple fracture of the leg, instead of being back at work in three months, may be crippled for life with an ununited fracture or a painful leg. The saving of compensation and of lost wages repays the cost of the clinics many times over. The modern technique of what Böhler calls 'the functional treatment of fractures' reduces the after-care work to relative simplicity.

It is the organization of these special clinics that is so important, firstly because it is not economic to apply the method to individual and isolated cases,

and secondly because a great part of the success of the method is psychological. To see other patients with leg injuries similar to his own walking without pain after a few days has such a good effect on the new patient that he is no longer a mental invalid, and very rarely is the compensation neurotic encountered. Many cases of Pott's fracture and fracture of the tibia can walk home the same day as their injury, and need not stay in bed one day. Many of them are able to carry on their work, and women patients are able to look after their housework.

The Main Principles of Fracture Treatment.—The problem of treatment in any fracture involves the three following principles:—

1. To reduce as perfectly as possible the fractured bone-ends under X-ray control.

2. To fix without interruption the fractured bone-ends until they have firmly united.

3. To use the injured limb during the period of immobilization.

It is time that those who treat fractures realized that no amount of physiotherapy, electrical treatment, or massage, will restore full function to a patient whose fracture has been incompletely reduced. It is waste of time and money for a patient with an unreduced Colles's fracture to receive massage and physiotherapy, for the end-result will only bring discredit to the masseuse.

In unreduced fractures the large hæmatoma formed between the bone-ends, and later the excess of callus formation, press on the surrounding lymphatics and blood-vessels, causing trophædema and passive venous congestion. The resulting passive hyperæmia leads to decalcification—'acute bone atrophy of Sudeck.' (See BONE DECALCIFICATION.)

If there is gross displacement of the bone-ends, the deep vessels become kinked, as evidenced by the appearance of great swelling below the fracture and of skin blisters. Perfect anatomical reposition of the displaced bone-ends leads to a quick union, with a minimum of callus. If the reduction is performed soon after the injury, the limb never swells and no skin blisters appear.

The second main principle is most important. If after reduction the injured limb is adequately fixed, there is no more severe pain. Patients frequently say that they have taken the splint off in the night because it was causing so much pain. If the splint was doing its work, there would be no pain, and the patient was therefore right when he removed it. If a splint is not completely immobilizing the fractured bone-ends, it is doing harm.

A childish superstition of reverence surrounds a padded piece of wood—so often a patient is sent up to hospital in a splint which is causing him pain and, by its weight, displacement of the bone-ends—for example, a back-splint and foot-piece used for a below-knee fracture. In the case of a Pott's fracture a firm bandage over wool is much more support than a back-splint and foot-piece, where the foot is anchored to the splint and the tibia is free to rotate and cause displacement and pain. Patients in these splints dread being touched, and frequently remove them when the doctor has gone.

Böhler has introduced the *unpadded cast*^{2,3} as a method of fixation after reduction. The method of application has to be learnt, and unless the surgeon knows how to apply these casts the results will be poor. After the application of unpadded casts the patients feel comfortable, they sleep at night, and no longer dread being touched.

The removal of splints for massage is wrong; there is risk of displacement of the fractured bone-ends. The only massage the patients need is the massage of function. Massage should not be allowed till the bones are firmly united, and then, if the reduction has been satisfactory, and the patient has been using the limb, there will be full function one week after removal of the plaster.

Massage may be used to reduce swelling prior to reduction of fractures more than eight hours old. It is impossible to feel the bone-ends when the limb is very swollen, but after the limb has been elevated and massage has been performed for one hour the bone-ends can be felt and reduction is simplified and more accurate.

In those cases where the swelling is very marked, it is advisable to perform the reduction in two stages. In the first stage the major deformity is corrected by traction and manipulation, and a plaster is applied to encircle the limb for two-thirds of its circumference only. The limb is kept elevated for two or three days, and then, when the swelling has disappeared, the final perfected reduction is performed. Elevation alone will not reduce the swelling, as the deformity causes kinking of the blood-vessels and a passive venous congestion of the limb.

Local anaesthesia is excellent for the reduction of fractures of the extremities, and should be used where possible. It should be of the greatest use to general practitioners who are unable to obtain the services of an anaesthetist.

Duration of Fixation in Plaster.—The most common fault in the treatment of fractures is to remove the splints too soon. If the plaster is removed too soon, there is danger of a chronic painful limb resulting, and, in the case of the weight-bearing bones, of non-union. The time of immobilization of a fracture depends upon two factors: (1) The age of the patient; (2) The degree of the injury. The healing time of bones varies with the seven ages of man. Under 12 years old it is very difficult to get a poor result with any fracture. After 40 years it is extremely difficult to get good results unless the very greatest care is taken.

The following table shows the times needed for immobilization in certain uncomplicated fractures, uninfected, and seen within eight hours of the accident:—

FRACTURE SITE	DURATION OF IMMOBILIZATION	COMMENCE WALKING	EXTENT OF PLASTER	CHANGE FROM LONG TO BELOW- KNEE TYPE OF PLASTER AFTER	BACK TO FULL WORK, AVERAGE TIME	
	Weeks			Weeks	Weeks	
Os calcis	12	14 days	To tuber ischii*	8	16	
Metatarsal	4	Immediately	To tibial tuberosity	—	7	
Pott's {	1st degree	4	Immediately	To tibial tuberosity	—	5
	2nd degree	4	Immediately	To tibial tuberosity	—	6
	3rd degree	7-10	Immediately	To mid-thigh	4	10-12
Fibula {	Lower third	8-10	Immediately	To mid-thigh	6	10-12
	Middle third	8-10	Immediately	To tuber ischii	6	10-12
	Upper third	8-10	Immediately	To tuber ischii	6	10-12
Colles's	4	—	To elbow	—	6-7	
Radius and ulna ..	6	—	To well above elbow	—	8	

* Böhler recommends leaving tibial transfixion pin *in situ*.

Local Anæsthesia in the Reduction of Fractures.—Local anæsthesia was first used in 1880 for the reduction of fractures. To-day it is widely used on the Continent in the fracture clinics, but it is seldom used in this country. Böhler has used local anæsthesia in many thousands of cases and cannot report any where there has been trouble from its use. It is excellent for the reduction of all fractures, there being scarcely any cases which cannot be reduced therewith.

Advantages.—The advantages of local anæsthesia are:—

1. After the injection into the fracture site the limb can be handled without pain. Local anæsthesia should therefore be given as soon as possible after the patient arrives at the clinic, thereby affording relief. The great suffering entailed by being undressed and having skiagrams taken is thus obviated. It is often impossible without the use of local anæsthesia to get true antero-posterior and lateral views of the fracture, as the change of position causes so much suffering. All pain is abolished almost immediately after the injection.
2. The anæsthesia lasts for two hours at least, by which time the limb can have been cleaned, X-rayed, reduced, and splinted. If the reduction is not satisfactory, a second attempt can be made within that time.
3. Difficult reductions can be performed in the X-ray room without hurry or the other disadvantages of a general anæsthetic.
4. Patients can go home the same day, immediately after the reduction and fixation, and need not wait the usual long recovery period necessitated by a general anæsthetic.
5. There is complete muscular relaxation, which is not easy to obtain with nitrous-oxide anæsthesia.
6. In cases where the patient is severely shocked, local anæsthesia is excellent. Once the fracture site has been injected, there is an immediate improvement in the general condition.
7. In cases where there is also a severe head injury as well as fracture of an extremity, local anæsthesia should always be used for reduction, as a general anæsthetic is unjustifiable.

Disadvantages.—Local anæsthesia has certain drawbacks:—

1. The patient has to be left for a quarter of an hour, if complete anæsthesia is required; therefore it is only economic to use when a number of fractures have to be reduced.
2. The hæmatoma is sometimes quite difficult to find.
3. If the fracture has been left for over six days, local methods will not give good anæsthesia.
4. Brachial block anæsthesia gives very inconstant results; sometimes the anæsthesia is perfect, sometimes very poor.
5. Very young and nervous children and hysterical adults are unsuitable subjects. However, after working in a large clinic for some time, one soon learns to recognize the unsuitable candidates.
6. In fractures with much swelling, such as is commonly found associated with supracondylar fractures of the humerus, it is unwise to inject a further 20 c.c. of fluid.

For the reduction of the following fractures local anæsthesia is excellent: (1) All below-knee fractures, compound or simple. (2) All wrist and forearm fractures, except those that need operative reduction. (3) Fractured femurs: (a) intracapsular fractures of the neck, (b) fractures of the shaft.

Technique of Injection.—Instruments needed: (1) Syringe, 25 c.c.; (2) Syringe, 5 c.c.; (3) Assortment of long fine-gauge needles.

The skin over the fracture site is first cleaned with ether soap and painted with tincture of iodine. If the fracture site is obvious and easy of approach,

a fine needle is thrust straight into the interosseous hematoma. On withdrawing the piston blood will enter the syringe, and 20 c.c. of 2 per cent novocain can then be injected slowly. If more than one bone is fractured, both hematomata have to be injected (e.g., radius and ulna). In fractures where the bones are deep below the muscles, the skin is first anaesthetized so that the search for the fracture site shall be painless.

Summary.—Local anaesthesia is of the greatest use in fracture work, and it should be especially so to the general practitioner who has to set fractures without any assistance. It is of great practical value to a fracture clinic where large numbers of cases have to be dealt with, for here several cases can be anaesthetized at once.

Fractures in Infancy.—It is universally recognized that the process of repair after injury is at once more rapid and complete in the child than in the adult. The tissues of the child are in a state of active growth; an analysis of the bones of young animals shows a greater percentage of organic matter. The periosteum is also much thicker and acts more definitely as a limiting membrane, preventing over-riding of the fragments. It is for this reason that greenstick fractures frequently occur, and that comminuted or compound fractures from within are so rarely seen in children. The process of repair shows the most striking contrast to that seen in old people.

In the newborn child whose femur has been broken by reason of difficult delivery, often after fourteen days there is no lateral instability of the limb. The enormous masses of callus thrown out by the seventh day have even been mistaken for a new growth. Because of the extreme difficulty of applying any form of splint to the newborn, shortening and angulation are very apt to occur, yet within six months it is often difficult to detect which limb was broken, so perfectly has the contour of the shaft been remodelled.

Infants are extremely difficult to splint on account of the delicacy of their skin and the large amount of subcutaneous fat; and their greatly increased power-to-weight ratio as compared with adults makes them poor subjects for traction. It is generally accepted that in these cases it is far better to use no splints at all. Many of the old methods advised, such as binding the extended leg to the abdomen in the case of a fractured femur, can do nothing but harm. Splints applied to the limbs of infants probably do more harm than good. Any good they do is only to the parents' troubled minds. The most important feature in the treatment of fractures in infancy is to re-design the child's clothes so that it may be attended to without traumatizing the fractured extremity.

While nature has thus simplified for us the treatment of these fractures, the balance is restored by the formidable difficulty in the treatment of displaced epiphyseal cartilages, for failure to correct completely any displacement may result in the most marked disturbances in growth (Matthew White⁴).

Fractures of the Outer Third of the Clavicle and Acromio-clavicular Dislocations.—These fractures and dislocations are of frequent occurrence. In cases of fracture the proximal end is pulled upwards by the sterno-cleido-mastoid muscle, the distal fragment being anchored to the scapula by the conoid and trapezoid ligaments. In dislocations of the acromio-clavicular joints these ligaments are torn, so that the whole clavicle is dislocated upwards.

The deformity is an ugly one; it is easily reduced by manual pressure, but recurs when the pressure is released. There is no splint that will adequately immobilize the fragments. Professor Young⁵ describes a method in which these cases are treated by the introduction of a steel pin, about the size of a No. 12 knitting needle, through the acromion process into the outer end of the medullary cavity of the clavicle. If necessary a small incision is made

over the fracture site to enable the fragments to be accurately replaced. The pin is withdrawn after three weeks, this being a simple procedure, as about an inch of the pin projects from the outer aspect of the shoulder.

Musculospiral Paralysis Complicating Fractures and Dislocations in the Upper Limb.—E. S. Gurdjian and A. G. Goertz⁶ state that 3 to 5 per cent of humeral fractures are accompanied by musculospiral paralysis. [In our experience the incidence is much higher, 10 to 15 per cent.] Most humeral fractures are due to extreme violence, and those where the fracture is in the lower half of the shaft often show signs of musculospiral involvement. Two types of paralysis are encountered :—

1. *Primary Paralysis.*—This comes on immediately after the accident. It is most important to test for it on the first examination of the patient, although this is often impossible owing to the fact that he has a head injury as well. Extension of the interphalangeal joints is performed by the lumbricales muscles, which are innervated by the median and ulnar nerves. This movement of the fingers may delude the examiner into thinking that no paralysis has occurred, so the best test for musculospiral paralysis is to ask the patient to lift the hand off a flat surface by extending the wrist.

2. *Secondary or Delayed Paralysis.*—This comes on after several weeks and indicates that the nerve is being involved in callus, or is being injured by pressure between the fragments. In fractures of the middle third of the humerus it is advisable not to be too energetic in the reduction, as in the manipulation the nerve may be impaled by the sharp fragments, or it may be so displaced that it may be pushed between them. Cases have been recorded where paralysis has followed the reduction of these fractures. As the arm is not a weight-bearing limb, exact reduction is not of great importance (unless the displacement impedes the function of the elbow-joint, as in supra-condylar fractures); simple traction is therefore advised in the reduction of these fractures.

Indications for Operation in Cases of Paralysis.—The indications for operation are as follows: (1) Anterior dislocation of the radius of old standing which cannot be reduced. Here it is advisable to reduce the length of the radius by removal of the head and neck. (2) Paralysis following reduction or attempts at reduction of fractures of the middle third of the humerus. (3) If a case of primary paralysis does not clear up after five months' conservative treatment, operation is advised. (4) All cases of secondary paralysis.

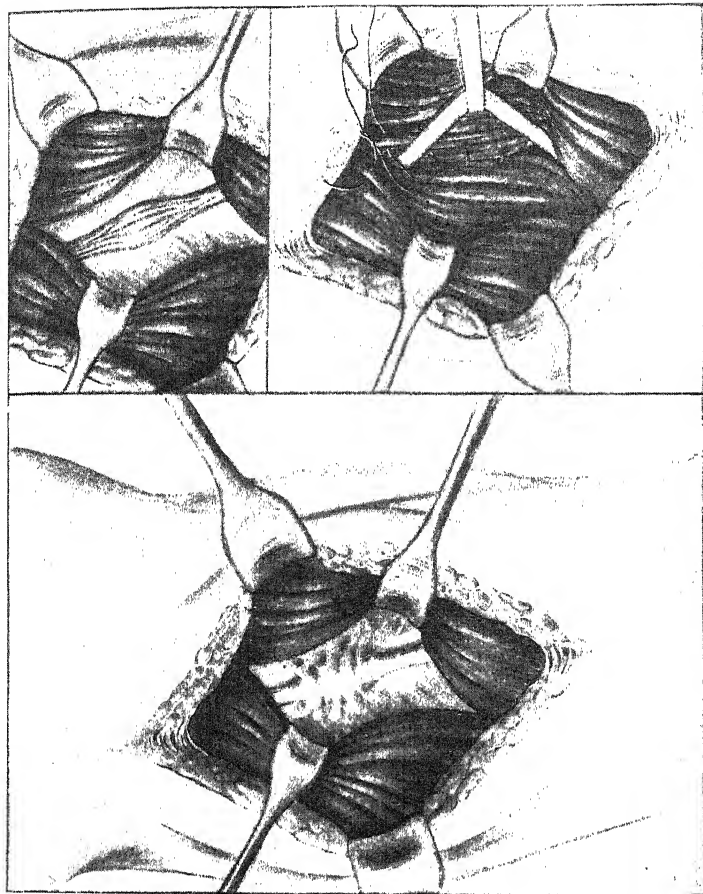
Operative Findings and Procedure.—The nerve may be found to be surrounded by scar tissue, to have a fibrous enlargement, or to be embedded in callus. The nerve is dissected clear and placed in a muscle bed as shown in *Plates XVIII, XIX.*

Fractures of the Surgical Neck of the Humerus.—These are amongst the most difficult in the body to treat. The shoulder is a notorious region for stiffness. Frequently these fractures are due to great violence, and occur in old people whose bones are extremely thin and decalcified. The cortical bone is very thin and liable to splinter, and accurate reduction is difficult even after operative exposure. The loose cellular tissue under the deltoid muscle becomes full of hæmatoma, which is apt to organize into fibrous tissue and form adhesions. It is important that in the after-treatment of these fractures the masseuse should not hurt the patient, for over-vigorous treatment in the effort to overcome stiffness is the most potent cause of stiffness. Any manipulation for adhesions should be performed under deep anæsthesia at a date not less than three months after the shoulder injury.

Böhler suggests for these fractures, following reduction, fixation on a traction-abduction splint. He recommends a position 40° forwards and 90° upwards,

PLATE XVIII—TREATMENT OF RADIAL NERVE PARALYSIS

(E. S. GURDJIAN AND A. G. GOERTZ)



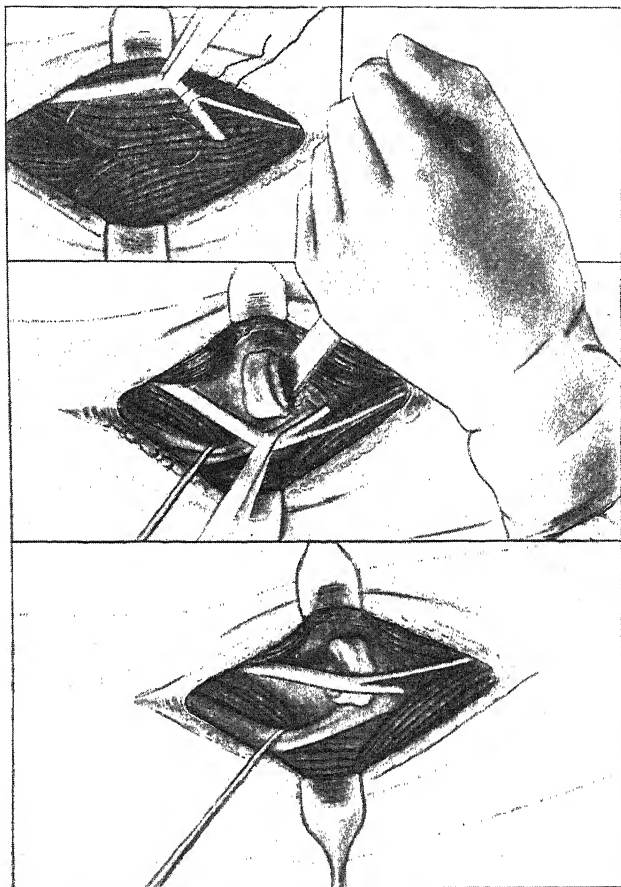
Neurolysis showed swollen nerve bundles traversing the pathological area. This portion of the nerve was therefore not resected.
Nerve placed in muscle bed.

By kind permission of the 'Annals of Surgery'

PLATE XIX

TREATMENT OF RADIAL NERVE PARALYSIS—continued

(B. S. GURJIAN AND A. G. GOERTZ)



The terminal portion of the radial nerve and its two branches were pushed forward by an anterior dislocation of the head of the radius.
Nerve placed in muscle bed.

By kind permission of the 'Annals of Surgery'

and states that these patients should be kept on an abduction splint until they can actively abduct their arms above a right angle.

N. J. Howard and L. Bloesser⁷ have constructed an experimental model, working with which they conclude that it needs less force to reduce these fractures if downward traction is employed. They point out that an abduction splint tends to cause a dropping of the distal fragment, and that control of the short fragment is obtained by virtue of the long head of the biceps, which bridges the fragments. Accurate approximation can be obtained and maintained by downward traction, the integrity of the long head of the biceps being necessary for the use of this method.

C. Frankau⁸ suggests that a bradawl be inserted into the upper fragment so that control can be obtained over this. He then recommends strong adduction of the arm for reduction of the fracture, as shown in Fig. 13.

Colles's Fracture.—The most common fault in the reduction of Colles's fracture is the failure to correct the backward angulation of the wrist-joint line. The normal joint makes an angle with the radius, opening downwards, of about 75° ; after a Colles's fracture the angle is frequently as much as 145° ; in fact, instead of the joint line facing ventrally, it faces dorsally. This causes the great disability which results from non-reduction of this fracture, i.e., loss of flexion and extension—the former because the alteration in the joint-line blocks flexion, and the latter because the flexor tendons are rendered so tight. The most common fault in the splinting of this fracture is the use of a splint which can allow the deformity to recur. The great difficulty in treatment is the fact that sometimes there is so much swelling that the bone-ends cannot be felt at the time of reduction.

Many types of Colles's fracture are met with in clinical practice. The most difficult to reduce are those with firmly impacted bones of good quality. Great force was used to cause this deformity, and great force will be needed to reduce it. Another type found is the comminuted Colles's fracture, where the fragments are not impacted, but are in several pieces, one at least involving the joint-line. In these the ulnar styloid is generally pulled off, and the difficulty in these fractures is the immobilization following reduction. It needs no great strength to reduce them, but when the great swelling which is associated with this type of injury has subsided, the splinting is loosened and so rendered inefficient, and the deformity may easily recur. This last type of fracture needs to be fixed in ulnar deviation, as there is a great tendency for union to take place in radial deviation.

Böhler suggests the following procedure in the treatment of Colles's fractures :—

Main Principles.—(1) Local anaesthesia is used; (2) Traction and counter-traction should be used for disimpacting the fracture; (3) Following disimpaction the fragments are manipulated into position; (4) Fixation is by means

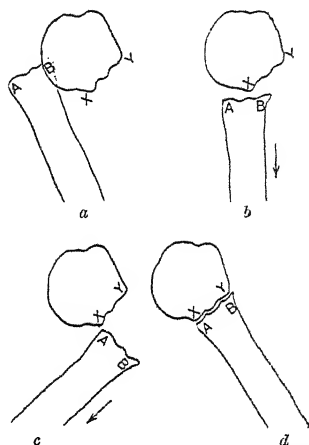


Fig. 13.—Method of reducing fractures of the surgical neck of the humerus by adduction. *a*, The unreduced fracture; *b*, Effect of simple traction in the line of the limb; *c*, Effect of adduction, bringing the points X and A into apposition; *d*, The final result. (By kind permission of 'The Lancet'.)

of a plaster cast. In recent fractures reduction is performed immediately, before swelling occurs. In these cases, provided the fracture is adequately reduced, there is no after-swelling, and the plaster can be completed at once. Those cases which are seen late, where the wrist is already swollen, should be massaged with the hand in the elevated position until the swelling has been pressed away and the bone-ends can be felt.

An X-ray before reduction is helpful in showing where to introduce the needle for local anaesthesia, but the most important X-ray is that taken after reduction. Local anaesthesia is used, for this gives freedom from pain for at least two hours, during which time the second skiagram should be taken, and if the reduction is found not to be satisfactory, it is re-done.

Reduction.—The first step after anaesthetization of the part is to lay the patient on his back, or else he is liable to increase the injury by leaning on his arm, which has now been rendered painless. The arm is abducted to a right angle and the forearm flexed and pronated. The arm is fixed by a sling to a hook on the wall, and the surgeon pulls on the thumb and first three fingers. When the fracture has been felt to disimpact (this needs considerable force) the fragments are easily manipulated into correct position, great care being taken to restore the radial curve. Traction being still maintained, a plaster slab 5 in. wide is applied to the dorsum of the forearm, from just below the elbow to the metacarpal heads. Traction is not released until the plaster is set. The slab is fastened to the limb with a wet gauze bandage. Where there is swelling the plaster is not completed until the next day, but in cases of no swelling, the cast is completed on the ventral surface from just below the elbow to the crease at the wrist. (*Plate XX.*) [In the reviewer's (K. H. P.) clinic a copper wire band is placed across the palm to keep the hand from falling forwards, and is fastened to the dorsal slab with a plaster bandage. This band enables full flexion of the fingers to take place without obstruction. If plaster is used here it must be cut to a width of about $\frac{3}{4}$ inch.]

After-treatment.—It is essential that the patient be seen the next day. He is given instruction that the arm must be kept elevated above the rest of the body on a pillow at night. In the daytime he is to use the hand as much as possible, within the limits of pain. When not in use the hand must not be hung down at the side, but must be kept up across the chest by gripping the coat on the opposite side. No sling is allowed, as this simply encourages an idle hand. In a simple Colles's fracture the plaster is removed in four weeks; where there is comminution it is kept on for seven weeks. On removing the plaster, half-range of movement in the wrist is immediately obtained, and after another fortnight the patients are found to have full range of movement without pain. Many patients are able to continue their work in plaster one week after the injury, and, on an average, they are back to full work, without splintage, in seven weeks.

Limitation of movement following a Colles's fracture and persistent after-pain are due to failure of reduction. The more perfect the reduction, the better the after-result. No amount of physiotherapy can ever make up for inadequate reduction.

Difficult Fractures of the Proximal Phalanges.—Fractures of the proximal phalanges are extremely difficult to treat, and if they are not reduced satisfactorily, may produce a stiff useless finger. A craftsman's earning capacity can easily be spoiled by a stiff finger, and it may give him as much disability as a fracture of the leg, or even more. To a machinist a stiff finger is a potential source of danger, as it is liable to get caught in revolving parts and endanger the whole hand.

The difficulties in treating these fractures are: (1) The deformity tends to

PLATE XX
COLLES'S FRACTURE
(L. BÖHLER)

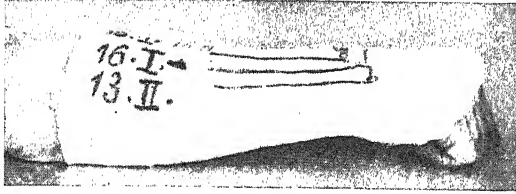


Fig. A.—Ordinary Colles's fracture treated by an unpadded dorsal plaster splint. This reaches from the knuckles to the elbow. The wrist is extended. The fingers can be fully flexed to form a fist.

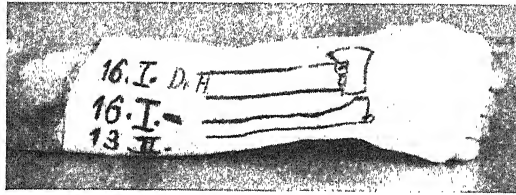


Fig. B.—Viewed from the dorsal side. The hand is in slight ulnar abduction. On the cast are marked the outline of the X-ray before reduction, the dates of injury, reduction, and removal of the plaster, together with the initials of the medical man who treated the case.

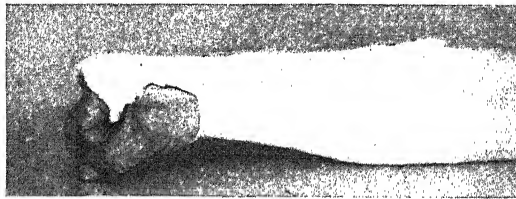


Fig. C.—Seen from the radial side. The cast is cut out round the base of the 1st metatarsal so that the thumb can be moved in every direction.

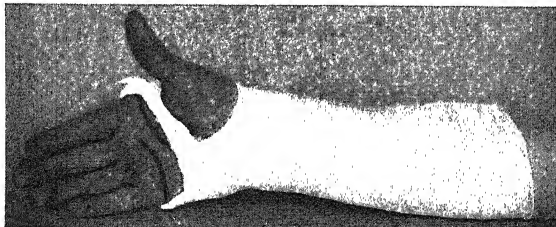


Fig. D.—Seen from the palm. The fingers can be fully extended. The part of the cast in the palm must be small so as not to hinder flexion of the fingers. The transverse palmar creases should remain free.

recur even after accurate reduction, on account of the strength of the tendons of the fingers. Traction must therefore be used in those cases which show a tendency to recurrence of the deformity. (2) The finger is very difficult to immobilize, especially if the fracture is a compound one. (3) If these fractures are left, the backward angulation of the distal fragment makes the finger useless.

Method of Treatment.—The fracture is reduced under local anæsthesia, injected either into the hæmatoma or round the top of the finger as a nerve-block. A short length of Kirschner wire is introduced through the pulp of the finger, $\frac{3}{8}$ in. from the tip. The wrist and the hand are immobilized by two skin-tight plaster slabs, applied from the metacarpal joints to the elbow-joint, one on the dorsal and the other on the ventral surface of the arm. To the ventral slab is attached a Cramer wire finger splint, bent round to the half-closed fist on the good hand. The upper surface of the splint is padded with adhesive felt, and the finger after reduction is flexed over this. Extension is made from the Kirschner wire to the end of the Cramer splint by means of a small wire stirrup. The principle involved is shown in *Fig. 14*. Extension

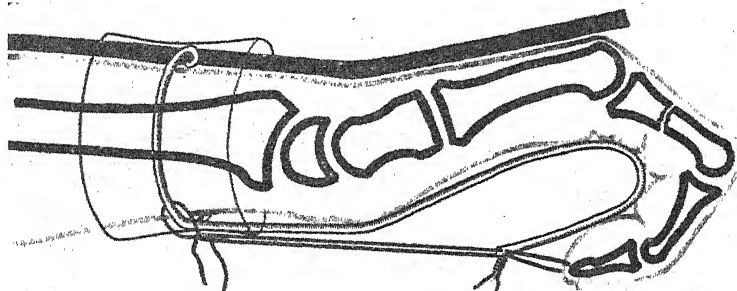


Fig. 14.—Appliance for fracture of a proximal phalanx. Dorsal plaster splint extending to the knuckles, the wrist being slightly dorsiflexed. Finger splint on the palmar side so bent that the knuckle-joint is bent 45° , the mid-joint 90° , and the terminal joint 45° . The terminal phalanx then lies parallel to the metacarpal. The wire through the tip of the finger is tied to the end of the finger splint, and this in its turn is fastened by soft wire to the base of the finger splint at the wrist.

is applied for three weeks after the wires are removed and finger movements have begun. The plaster is removed after about another week. Very accurate reduction can be obtained by this method and the results are excellent. Compound finger fractures can be treated in this manner with great ease.

Intracapsular Fractures of the Neck of the Femur.—Albert and Alain Mouchet⁹ describe the occurrence of latent fractures of the neck of the femur. They state that this condition of latency is by no means uncommon. A patient has a fall and is able to walk afterwards; he may go to hospital and be carefully examined, and yet turn up later suffering from arthritis of the hip with the typical deformity of an old intracapsular fracture. All the patients he describes were able to walk after the accident, and it was only after several months that symptoms appeared.

Although Delbet maintains that impacted fractures never occur, these writers state that the condition is quite common, and urge that all those that have a fall on the greater trochanter after which they get pain and a limp should be carefully X-rayed. The treatment is bed with exercises for from thirty to forty days. X-rays should always be taken of these cases in a position of

internal rotation of the hip. The lateral views obtained by using a curved cassette in the perineum with the leg abducted are of great use. This method has been described in the *American Journal of Roentgenology*.

People of all ages suffer from this type of fracture, but it most commonly occurs in women after the age of 55; they are generally rather heavily built, and have decalcified bones, and are those who have given up an active existence. In children aged 13 to 17 years the best and simplest method of treatment is a Whitman walking plaster. The patient after reduction can begin walking immediately and the results are excellent. The treatment is similar to that of adolescent coxa vara.

Technique of Treatment.—The hip is reduced by traction and internal rotation and then abducted. An X-ray is taken to check the reduction, and if this is not satisfactory it is performed again. The reduction is extremely easy if it is done within a week of the fracture.

A skin-tight plaster is applied from just below the rib margin to the foot with the leg abducted and internally rotated, the knee being kept flexed about 30°. No padding is used except that all bony projections are covered with adhesive felt. A wooden crutch is incorporated in the plaster parallel to the good leg. The patient should be in plaster from three to four months.

In the aged this fracture is a very serious matter. Two types of patient are met with: First, the very aged and decrepit, full of bronchitis, who become quickly chesty following the injury. Nothing can be done for them; they are better left alone. They were in any case probably not leading an active life before the injury and will not be much more incapacitated after it. The death-rate among these patients is extraordinarily high with or without treatment. The second type of case is the good operative risk, and here we have the choice of various methods.

First, there is the Whitman's plaster. The fracture must be reduced properly before the plaster is applied. The failures from this method have been from incomplete reduction of the fracture. From 50 to 60 per cent of cases get a good functional result where the Whitman technique is properly carried out. Here again the use of the lateral X-rays using a curved cassette are invaluable.

In those who are not fat the skin-tight plasters give the most satisfactory results and the best immobilization. The patient should sit out on the edge of the bed the following day, and after one month should begin walking with a third leg attached to the plaster. If function is not carried out, there is progressive decalcification in the region of the neck of the femur, and for this reason these fractures frequently do not unite.

Recently much literature has been written on the work of Smith-Petersen's pinning operation, and many modifications of the original pinning method have been introduced. That described by Thomas King¹⁰ is simple and excellent. The Sven Johansson modification of the Smith-Petersen pin has greatly simplified the operation. An easy technique is as follows:—

The patient is put to bed and sits upright for four to five days, until the shock has disappeared. A zinc and gelatin extension is put on the leg, which is then treated by the Russell method. This prevents adaptive shortening of the muscles and renders future reduction easy. Both hips are X-rayed, the good hip in a position of internal rotation, and from this skiagram the length of the neck of the femur is estimated so that the right length of pin can be gauged.

The patient is placed on some modification of the Hawley table with a pelvic rest, having been anesthetized. Both knees are bent and traction is applied on each knee by an assistant until full length is obtained by measurement from the anterior superior iliac spine to the superior border of the patella. Then the legs are abducted until an equilateral triangle is made from the

umbilicus to the superior borders of the patella. The affected limb is now internally rotated until the greater trochanter reaches its most prominent position, that is, when the neck of the femur is horizontal. A $3\frac{1}{2}$ -in. incision is made over the middle of the greater trochanter in the axis of the limb right down to the bone. The upper border of the origin of the vastus externus is then seen as a tendinous mass which occupies a hollow below the greater trochanter. A finger can be placed both in front of and behind the neck of the femur with ease, and with them the position of the fragments and the direction of the neck can be estimated. A Kirschner wire is now introduced about $\frac{1}{2}$ in. below the upper limit of the origin of the vastus externus muscle and in the middle of the outer surface of the shaft of the femur. The wire is directed towards the opposite anterior superior iliac spine (which has been

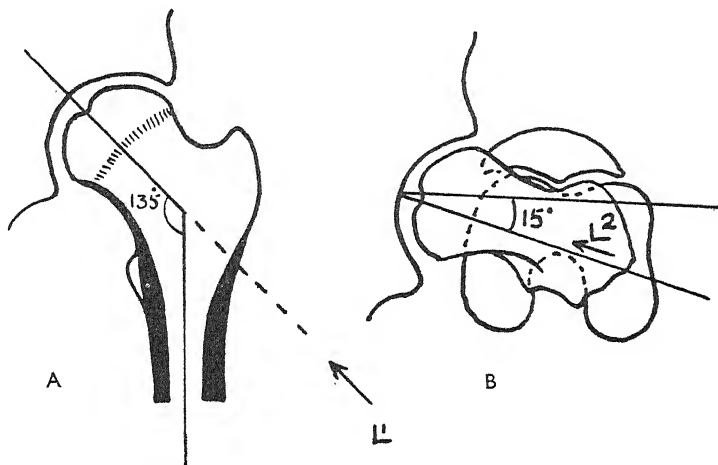


Fig. 15.—A. The diagram shows a vertical neck-shaft angle of 135° . L^1 represents the central longitudinal axis of the neck, seen in the front plane. The line passes through the head at right angles to its diameter. The especially dense cancellous bone of the former epiphyseal line is indicated. As the line L^1 passes downwards and outwards it is projected upon the lateral aspect of the femur at the junction of the shaft with the base of the great trochanter. It is from this shaft-trochanteric junction that the nail should start its course along the guide wire, which is represented by line L^1 .

B. Diagram showing the declination or torsion angle of the neck of the femoral shaft. L^2 represents the central longitudinal axis of the neck seen in exactly the opposite plane to the last diagram. The true frontal or transverse axis of the femur is represented by the anterior surfaces of the femoral condyles or the transverse axis of the patella. The long axis of the neck (L^2) is seen to be rotated 15° forwards to the frontal plane of the femur. (Re-drawn from 'The Medical Journal of Australia'.)

found anatomically to correspond with the line of the neck of the femur). So accurate is this simple procedure that the wire, on taking an X-ray, is generally found to be in exactly the correct position. It is first felt to penetrate the cortical bone, it then passes easily through the cancellous bone, and the next resistance which is met with indicates the beginning of the cortical bone covering the head of the femur. The wire is drilled in about $\frac{1}{2}$ in. further than this so that it enters the bone of the acetabulum. Unless the wire is anchored at both ends it does not guide the pin accurately, as it can move freely in the cancellous bone and the pin will guide the wire rather than the wire the pin. An X-ray is now taken to check the position of the wire. The Smith-Petersen pin is threaded over the wire and driven home with a punch which has a hole through the centre for the Kirschner wire. The neck is impacted

into the head by means of a hollow punch which fits over the head of the pin. The incision is closed. The whole of this procedure need only take about twenty minutes, and the patient can move without pain the next day and is encouraged to do so in bed. The operation has not been tried sufficiently long

for us to be able to estimate as yet when is the optimum time for weight-bearing to begin. The immediate results are excellent, however, and the disadvantages of a heavy plaster and of difficult nursing are avoided. (Figs. 15, 16.)

The Use of the Unpadded Cast in Common Below-knee Fractures.—

1. *Ankle Fractures.*—The simplest form of injury found about the ankle is that of torn ligaments with or without a fracture of one or other malleolus. These require no reduction as there is no displacement. A short (below-knee) walking plaster is applied, and the patient made to walk immediately. There is apt to be great swelling with these ligamentous tears, so before applying the plaster it is essential to reduce this by massage in the elevated position and the application of anodal galvanism. After the application of the plaster these patients can walk immediately without pain, and after three weeks the plaster is removed and they experience no further trouble and need no further treatment.

Where there is a fracture with displacement, reduction will be necessary. This should be performed on the same day as the accident. If there is gross displacement with great swelling, the reduction will have to take place in two stages. Where there is gross displacement, simple elevation alone is not enough to reduce the swelling, as the vessels are probably



Fig. 16.—Diagram showing the true lateral aspect of the upper end of the femur and the pelvic bones. Note the fracture site, with reduction of any deformity, so that the neck looks forward at about a declination angle of 15°. Observe the subcutaneously placed wire, 1, which was introduced behind the neck under fluoroscopic control until passing over the fracture site it impinged upon the acetabular rim. The second or true guide wire, 2, has been drilled into the femur midway between the first wire and the front border of the bone, but inclined very slightly (about 5°) more forward than the first wire, 1. (Re-drawn from 'The Medical Journal of Australia'.)

kinked about the site of the fracture. The fracture site is anesthetized by local injections, and a Kirschner wire is introduced through the heel. The leg is put in the Böhler apparatus and reduced as perfectly as is possible. A light plaster is applied encircling the limb for two-thirds of its circumference only, and extending up to the tuberosity of the tibia. The patient is then treated in the ward on a Braun's splint, with 10 lb. traction on the wire, for ten days, by which time the swelling will have subsided. The plaster is removed and the limb again put in the Böhler apparatus, and the final reduction takes

Fig. 17.—The U strip is applied. It is moulded very carefully over the malleoli, which it holds in the reduced position when hard. This U strip enables an equally strong and much lighter cast to be made than is possible when the single posterior splint is used and reinforced with layers of circular plaster bandages.

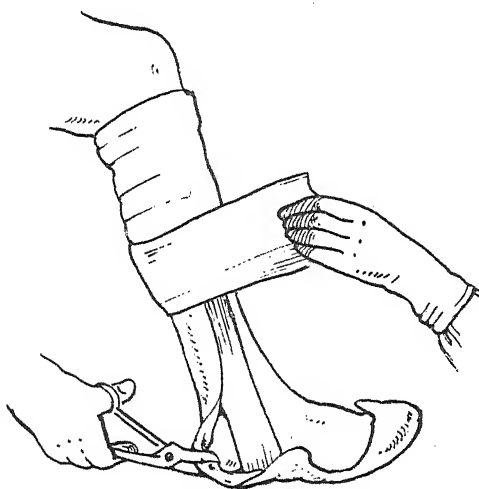
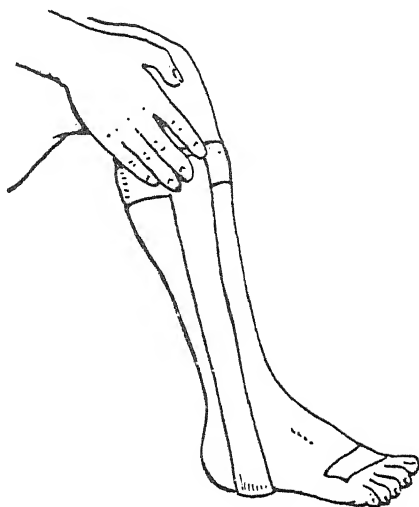
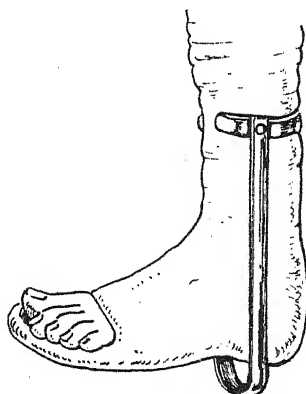


Fig. 18.—The next stage is the application of a posterior six-inch splint (to beyond the toes), which overlaps the U splint. It is split on each side from the malleoli to the point of the heel. It is bound on with a gauze bandage.

Fig. 19.—The walking iron is placed exactly in the long axis of the limb, otherwise the patient walks with anterior or recurvation strain on the knee; also the lower curved end of the iron is placed at a distance below the sole corresponding with the height of the opposite heel. If the distance is too great, the patient walks with a flexed knee; whilst if too short, the end of the cast under the sole and toe scrapes on the ground and eventually breaks off. (*Figs. 17-19 re-drawn from 'The Australian and New Zealand Journal of Surgery'.*)



place. Now the swelling has subsided it is quite easy to get perfect anatomical position. This is checked by X-rays, a walking plaster is applied, and the patient can begin weight-bearing the next day.

Method of reduction: Instruments needed: (1) Local anæsthetic; (2) Böhler's leg-traction apparatus; (3) Kirschner wire extension apparatus and spring-balance.

The Kirschner wire is introduced, under local anæsthesia, through the posterior part of the os calcis, and, by means of this, traction is exerted on the lower fragment. In eversion fractures the pull should come from the outer part of the stirrup, thus slightly inverting the heel. Before fixation the foot must be placed in a position of maximum dorsiflexion, because, first, the astragalus is broader in front than behind, and will fit the ankle-joint more accurately in this position; secondly, if the foot is not dorsiflexed, the walking iron will have to be unduly long, and the other heel will have to be raised with a patten on the other boot.

After the fracture site is anæsthetized, the leg is placed in the Böhler apparatus and a pull of 20 lb. is exerted, as shown by the spring-balance. Then the surgeon performs the reduction with his hands, grasping the tibia above and the tarsal region below. After reduction, the malleoli, if grossly displaced, are pressed into position with the hands, thus remodelling the mortice which has been destroyed.

A plaster is applied consisting of a U-shaped stirrup, a back-slab, and one encircling bandage. The making of plaster bandages and the method of application is excellently described in an article by Thomas King³ (*Figs. 17-19*). In difficult cases, it is best to check the reduction before fixation in a plaster, by means of an X-ray plate, using a shock-proof portable machine. *Plate XXI* illustrates this.

2. *Fractures of the Tibia.*—If the fracture is simple and there is no gross displacement, an immediate plaster is applied, up to the mid-thigh in the lower-third fractures, and up to the tuber ischii in middle- and upper-third fractures.*

In difficult fractures and in cases with comminution, Böhler describes a double pinning operation, where, after reduction, two pins are introduced into the tibia, one above the fracture and one below it, but well above and well below the fracture site. Plaster is applied incorporating these pins, which fix the fragments and prevent angulation inside the plaster. This is illustrated in *Plate XXII A, B, C*, which show the limb in section. After the plaster is completed, a Böhler iron is fixed to the bottom as shown in *Plate XXII D*, and the patient can begin walking immediately the plaster is set, with the aid of two sticks. He must be seen, however, the next day, and given careful instructions to keep the leg elevated when not walking, otherwise circulation may be endangered. It is most important to give the patients written instructions of what to do should the plaster become tight. A copy of the instructions given to each in writing is shown in the table on the opposite page.

Advantages of the Skin-tight Technique.—

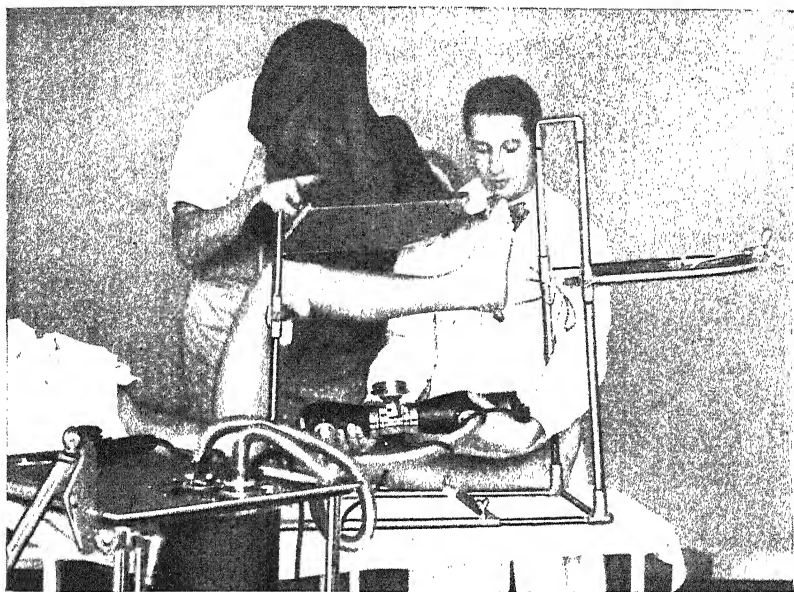
1. The patient is able to walk home the same day in most fractures. This saves hospital beds, and the patient is not an invalid; he can look after himself and needs no attention at home.
2. There is complete freedom from pain once the fracture has been properly reduced. Patients sleep well at night.
3. Union is quicker and more solid.
4. Even though the immobilization may be for as long as three months,

*In all plasters reaching above the knee the reviewer (K. H. P.) uses Cellona to lighten the casts, which are otherwise unduly heavy.

PLATE XXI

ANKLE FRACTURES

(L. BOHLER)



Position controlled by viewing with portable X-ray screen.

PLATE XXII FRACTURES OF THE TIBIA (L. BÖHLER)

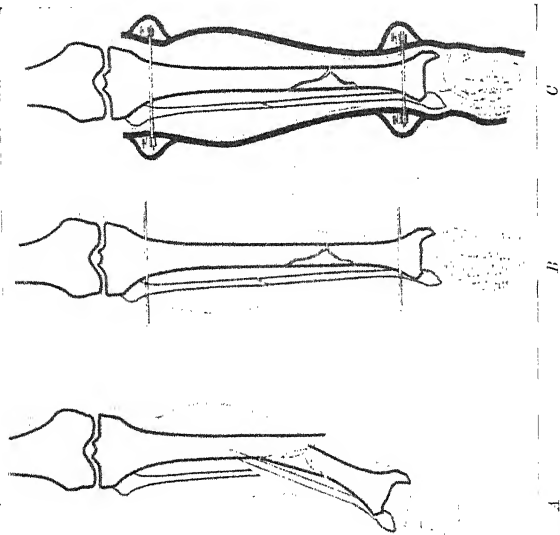


Fig. A.—Angular fracture of the lower leg bones with large wedge-shaped third fragment of the tibia.
Fig. B.—After reduction by the screw traction apparatus a stainless steel transfixion pin 15 cm. long is driven through the upper and lower ends of the tibia.
Fig. C.—Whilst traction is maintained a plaster cast is applied from the knee to the tips of the toes. The pins fastened by rings and fixation screws. Plaster covers over the ends so that the pins cannot rotate.

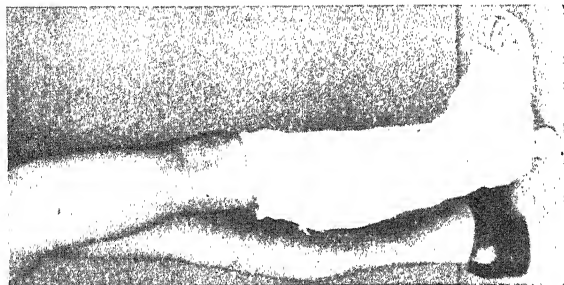


Fig. D.—Finished cast with walking iron.

Plates XX-XXII and Fig. 14 are from L. Böhrer's 'The Treatment of Fractures', translated by E. W. Hey Groves.

one never meets such a thing as chronic œdema of the ankle, and the joints, although immobilized, never become stiff as they do in the non-ambulatory methods.

5. Many cases of severe comminuted fracture of the tibia have only had to draw six weeks' compensation pay.

6. The average patient with a Pott's fracture can attend to his business, and the housewife can do her housework, while in plaster. This method cuts down the disability of the patients enormously.

INSTRUCTIONS TO OUT-PATIENTS WITH FRACTURES (BROKEN BONES),
INJURIES, OR DISEASES TREATED IN A PLASTER OF PARIS CAST.

Name of Patient

- (1) For the next..... hours you must lie down.
- (2) During that time, in the case of a fracture of any bone in the upper limbs have the hand raised so that it is the most elevated part of the body.
In the case of the lower limbs (for example, a broken ankle) raise the foot of the bed and place the plaster cast on a pillow.
You should report to the Casualty Department if you notice any tightness of the plaster cast, indications of which you will notice in the fingers and toes as follows:—
 - (a) Marked swelling.
 - (b) Marked blueness.
 - (c) A tight severe pain which is not eased by elevating the limbs.
 - (d) Inability to move the fingers or toes. (You should continually move them even while resting.)
 - (e) Numbness or loss of sensation.

Report daily until further notice.

..... Surgeon in Charge.

7. The cost to the patients of journey-money for massage is considerable if they have to attend daily. The method entirely abolishes this factor.

8. Provided the case is seen by the general practitioner at regular intervals, it need only be seen by the surgeon who performed the reduction four times during the whole treatment.

9. The compensation neurosis is entirely dispensed with.

REFERENCES.—¹L. Böhler, *The Treatment of Fractures*, Wright, Bristol; ²F. Schneck, *The Technique of the Unpadded Cast*; ³T. King, *Austral. and N.Z. Jour. Surg.*, 1933, July, 49; ⁴*Glasgow Med. Jour.* 1934, Jan., 31; ⁵*Ibid.* 43; ⁶*Ann. of Surg.* 1934, March, 487; ⁷*Jour. Bone and Joint Surg.* 1934, xvi, Jan., 1; ⁸*Lancet*, 1933, ii, Sept. 30, 755; ⁹*Presse méd.* 1934, Feb. 28, 329; ¹⁰*Med. Jour. of Australia*, 1934, Jan. 6, 5.

FUNGOUS INFECTIONS OF SKIN. (See SKIN, FUNGUS INFECTIONS OF.)

GALL-BLADDER AND BILE-PASSAGES, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Papers dealing with this subject from British, French, German, and Italian sources have been few during the past year, but there has been a veritable spate of printers' ink across the Atlantic, the topic of principal interest being the question of early surgical interference in the acute cases with fever.

Diagnosis of Gall-stones.—In the course of a general article, W. T. Doran and three collaborators¹ mention that *biliary drainage*, obtained by the duodenal tube and administration of magnesium sulphate, is of considerable diagnostic value; in 26 cases cholesterin crystals or bilirubin calcium were found, and in 25 of these stones were present, and in the other 'sand' in the gall-bladder. The absence of crystals, however, does not exclude stone.

The Silent Gall-bladder.—Incidental palpation of the gall-bladder during the course of an operation in women often shows the unexpected presence of gall-stones: 31 times in 350 cases in E. D. Truesdell's² experience. Only in 6 patients did he perform cholecystectomy at the time. [Under these circumstances, I prefer removal of the stones with closure of the gall-bladder, provided of course (1) that the gall-bladder seems healthy, and (2) that this addition to the surgical programme is likely to be well borne.—A. R. S.] In 5 others he dealt with the gall-bladder at a subsequent operation, but, as he remarks, the patients do not receive the information of their condition with uniform enthusiasm; some are incredulous, some annoyed, and one threatened suicide! Eight out of the 25 in which the stones were not removed at once eventually developed typical symptoms of biliary colic or biliary dyspepsia.

The Question of Surgery for Acute Cholecystitis.—No fewer than six papers on this subject, all worthy of notice, have been contributed by American surgeons: Morris K. Smith,³ of New York; H. B. Stone and J. B. Owings,⁴ of Baltimore; G. H. Pratt,⁵ of Philadelphia; H. Bashin,⁶ of New York; A. S. W. Touroff,⁷ of New York; and M. Behrend,⁸ of Philadelphia. Smith commences with the words, "The management of acute cholecystitis arouses more differences of opinion among surgeons than that of any other acute abdominal disease of like importance. In 1928 Bruggeman presented a paper . . . he found opinion divided in England, in favour of intervention without delay in France, and in general conservative in Germany." In the United States the majority have preferred to wait for the attack to subside unless the condition is urgent, but the recent American contributions are mostly in favour of prompt surgery. Stone and Owings, and also Pratt, argue in favour of operation without waiting, on the analogy of the treatment of acute appendicitis; if the patient's inflammation is going to subside, he will stand an operation, and if not, the sooner it is done the better. The gall-bladder is grossly diseased, therefore it ought to be removed at once. According to Pratt 10 out of 45 acute cases operated on died in Babcock's clinic; in spite of this alarming mortality he advocates cholecystectomy at once. Morris Smith decides that immediate operation is unwise unless there is evidence of perforation; it is better to wait, unless resolution fails to occur, and remove the gall-bladder several weeks later. Some of his cases he believes were killed by operation in the acute stage. In a series of 107 acute cases operation during the first week gave a mortality of 7·8 per cent, and during the second week 15 per cent. Behrend also is in favour of conservatism. Touroff says that 80 per cent of the acute cases tend to recover and 20 per cent to get worse; he advocates waiting, but operates within a few days of the subsidence.

[The mortality figures quoted by American authors in favour of early cholecystectomy for acute cholecystitis are far higher than those we obtain by conservative treatment, and we quite agree with Morris Smith that some patients are killed by doing too much in the acute stage. We believe the safest procedure is as follows:—

First day of acute attack.—Usually, wait, but if the patient has had severe attacks previously, or there is any question of perforation into the peritoneal cavity, immediate operation.

Second to fifth day.—Wait for subsidence.

Fifth or following days.—If the patient is not improving, if pain and fever persist, or if the gall-bladder is getting bigger, operate under novocain-gas-oxygen; open and drain the gall-bladder and extract any stones.

Interval operation may be within a few days of a mild attack; postpone for three weeks after a severe attack.—A. R. S.]

Perforation of the Gall-bladder.—At the Mayo Clinic, which draws many chronic cases and a few acute ones, there were 61 perforations of the gall-bladder in ten years, but only in 2 cases was there bile in the peritoneal cavity; usually there was a localized collection. In 6 there was a fistula into the duodenum (Starr Judd and J. R. Phillips⁹). The usual treatment was cholecystectomy; sometimes, drainage. E. L. Eliason and C. W. McLaughlin,¹⁰ working in the busy centre of Philadelphia, find that 2 per cent of their gall-bladder cases showed perforation into the peritoneum, usually patients with a long history of gall-stone trouble. Pre-operative diagnosis is rarely made, and the death-rate varies from 11 to 50 per cent.

Stones in the Common Duct.—It is well known, of course, that a patient may have a stone lodged at or above the ampulla of Vater without any jaundice, and it is very easy to miss it on palpation from outside. If there has been jaundice recently, or if the bile-ducts are dilated, a stone ought to be suspected present until proved absent. In such cases F. H. Lahey¹¹ advises opening the common duct and passing an open-ended metal suction tube down it; this will often suck up quite small calculi. R. R. Graham,¹² of Toronto, probes the duct with Sims' graduated urethral sounds, which will also serve to dilate a narrow ampulla. Or, water may be injected; if it flows on into the duodenum, there is no obstruction; if it all comes back, a cause must be sought.

D. Miller¹³ describes Sir A. MacCormick's method used in Sydney: the common duct is opened, the stone extracted, the ampulla dilated with sounds up to 11/13 Lister, and the incision in the duct closed, with a cigarette-drain through a stab-wound in the loin running down close to the duct.

Obstructive Jaundice.—H. M. Clute and N. W. Swinton,¹⁴ of the Lahey Clinic, at Boston, write on the treatment of obstructive jaundice due to stone, growth, or stricture. The best token of complete biliary obstruction is absence of bile when the duodenal drainage test is carried out. A blood examination should be made, but neither the coagulation time nor the blood sedimentation rate is a reliable indication whether the patient will bleed after operation; the sedimentation test is better than the other. The functions of the kidney have often suffered, and should be investigated. At least five days should be devoted to pre-operative preparation, in which intravenous administration of glucose (100 to 200 gm. in twenty-four hours) and sodium chloride, carried out continuously day after day, plays the most important part. Calcium chloride is much less valuable than blood transfusion to prevent bleeding; a whole team of donors may be required. The glucose and saline are kept up by continuous venoclysis after operation. Obviously the clinic was handling a dangerous type of case; 10 out of 34 suffered from post-operative hæmorrhage.

Chronic Jaundice.—A. H. and S. Strauss and R. A. Crawford,¹⁵ of Chicago, describe 22 cases of what they call '*chronic biliary stasis*', associated with a swollen inflamed ampulla of Vater and œdema and narrowing of the lower part of the common duct, due probably to duodenitis. Some of these patients have deep 'silent' jaundice, others have attacks like gall-stone colic, and others have both. Their treatment is cholecystectomy and side-to-side choledochoduodenostomy and gastrojejunostomy. If the last is not done, the patient may suffer from attacks of pain and fever due to ascending infection of the bile-ducts from the duodenum; barium can even be shown reaching the branches of the hepatic duct.

A rare but important cause of chronic jaundice is *carcinoma of the bile-duct*; the patient's only hope lies in early operative removal. W. E. Lee and H. P. Totten¹⁶ relate two cases, both of which ended fatally. E. B. Potter¹⁷ had a successful case, and mentions another alive and well eight years after operation. E. Lauwers¹⁸ says that removal of a cancer of the ampulla of Vater is not very difficult, and whether it is attempted in one stage or two, the first step should be a cholecyst-jejunostomy or a choledocho-duodenostomy; he does not approve cholecyst-gastrostomy as the gastric juice damages the mucosa of the gall-bladder. The tumour is often no larger than a pea, and may be friable and mobile. Transduodenal excision is best. The pancreatic duct must be re-implanted. Both Lauwers' patients did well.

Statistics.—G. J. Heuer,¹⁹ of New York, analyses the causes of death in gall-bladder surgery. In his own hospital there were 5 deaths in 200 recent cases (2.5 per cent); in 37,623 cases assembled from European and American literature, 2453 deaths (6.6 per cent). The causes of the fatality are classified as follows:—

**CAUSES OF DEATH—NEW YORK HOSPITAL, 1000 CASES;
LITERATURE, 36,623 CASES.***

GANGRENE AND PERFORATION		CONSEQUENCES OF SURGICAL PROCEDURE, PERITONITIS, SHOCK		PULMONARY COMPLICA- TIONS		CARDIORENAL COMPLICA- TIONS		LIVER DEATH		PANCREATIS		MISCELLANEOUS AND UNDETERMINED	
Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
11	10	37	33	25	20	10	12	?	4	?	2	17	19

* The figures on the left in each column refer to New York Hospital cases, those on the right to cases from the literature.

R. S. Fowler,²⁰ of Brooklyn, reports a mortality of 5.9 per cent in 1206 cases treated there; a follow-up showed that of the cholecystostomy cases 58.1 per cent were well, 14.5 better, and 27.3 per cent had severe symptoms. After cholecystectomy 86.6 per cent were well and only 3.7 per cent had severe symptoms. A report from Vienna and Innsbruck is furnished by E. Ranzi²¹; of 1031 cases operated on, 7.2 per cent died; amongst acute cases the mortality was 20.2 per cent. One of the very few British papers of the year is by G. H. Edington,²² who finds that at Glasgow 24 out of 200 died (12 per cent).

Visualization of the Bile-ducts.—The use of lipiodol at operation to enable the bile-ducts to be rendered visible by X rays was referred to in the MEDICAL ANNUAL of last year (p. 187); the method is well spoken of by A. H. Kretschmar,²³ of Battle Creek.

Internal Biliary Fistulæ.—According to F. Bernhard,²⁴ these were found in 109 out of 6254 gall-bladder operations. There have usually been severe attacks of pain, often with jaundice or rigors, over many years, the average being eight. The gall-bladder is usually shrunken and adherent. The fistulæ led into the duodenum (56 cases), stomach (36), or colon (12). In operating it is necessary to avoid fouling of the peritoneum with the contents of the fistulæ, which are often highly toxic. The viscera are separated, the fistula is divided between forceps, the hole in the alimentary canal closed, and cholecystectomy performed. It may be necessary to open and drain the common duct. The mortality was 8.3 per cent; 75 per cent got well.

Cholecystgastrostomy and allied Operations.—A critique is published by F. Bernhard,²⁵ based on the results of a study of 128 cases. Cholecyst-duodenostomy is the best treatment for chronic pancreatitis, cancer of the

pancreas, or stenosis of the common duct. Ascending cholangitis is particularly apt to follow if pancreatitis and gall-stones are both present. Cholecyst-gastrostomy is often easier, but the danger of infection is greater. When the gall-bladder has been removed, the common duct may be anastomosed to the duodenum. About 6 per cent die of ascending cholangitis, and many more suffer from repeated attacks it, of but about 60 per cent remain symptom free.

REFERENCES.—¹*Ann. of Surg.* 1933, Sept., 321; ²*Ibid.* 362; ³*Ibid.* Oct., 766; ⁴*Ibid.* 760; ⁵*Amer. Jour. Surg.* 1933, Oct., 46; ⁶*Ibid.* 1934, April, 506; ⁷*Ann. of Surg.* 1934, Jan., 900; ⁸*Ibid.* 925; ⁹*Ibid.* 1933, Sept., 359; ¹⁰*Ibid.* 1934, Jan., 914; ¹¹*Ibid.* 1933, Oct., 644; ¹²*Canad. Med. Assoc. Jour.* 1934, Feb., 119; ¹³*Austral. and N. Z. Jour. Surg.* 1934, Jan., 265; ¹⁴*New Eng. Jour. Med.* 1934, June, 1265; ¹⁵*Jour. Amer. Med. Assoc.* 1933, Oct., 1365; ¹⁶*Ann. of Surg.* 1934, June, 930; ¹⁷*Ibid.* 1933, Sept., 369; ¹⁸*Jour. de Chir.* 1933, xlii, 833; ¹⁹*Ann. of Surg.* 1934, June, 881; ²⁰*Amer. Jour. Surg.* 1933, Oct., 53; ²¹*Wien. klin. Woch.* 1934, June, 719; ²²*Glasgow Med. Jour.* 1933, Nov., 153; ²³*Amer. Jour. Surg.* 1933, Sept., 383; ²⁴*Deut. Zeits. f. Chir.* 1934, March, 493; ²⁵*Ibid.* May, 736.

GASTRIC AND DUODENAL ULCER. Robert Hutchison, M.D., F.R.C.P.

ETIOLOGY.—A. B. Rivers¹ reviews at length the various hypotheses which have been put forward to explain the formation of peptic ulcers and attempts to apply them to the problem of ulcer in man. He arrives at the unsatisfactory (but not unexpected) conclusion that in all probability ulcer is the result of several interacting and variable factors which vary in different subjects at different times. Each patient, therefore, presents an individual problem.

E. W. Saunders² and others claim to have isolated from 30 resected gastric and duodenal ulcers an organism (streptococcus) which is not identical with any other streptococcus tested, but is identical with three others isolated from cows' milk. They state that they have been able to produce ulcers in dogs by feeding the organism to them.

The question of the *relation of smoking to the production of ulcer* has often been discussed. O. A. Trowell³ has compared the smoking habits of 50 men suffering from duodenal ulcer with those of 400 normals. He found that the ulcer patients did not (on the average) smoke more than the controls, but that the practice of inhaling was more than twice as common amongst them.

PROGNOSIS.—A discussion on the prognosis of peptic ulcer took place at the Royal Society of Medicine⁴ and exhibited more unanimity than might have been expected. Bolton quoted the statistics of Nielsen⁵ showing the importance in prognosis of the previous duration of the ulcer. In cases in which the ulcer has been present more than five years a permanent cure by medical means is obtained in 10 per cent only. Conybeare states that of 100 ulcer patients not more than 5 would die directly as the result of the ulcer. The longer the period of observation after medical treatment, the smaller the proportion of cures. Pyrah, quoting experience at Leeds between 1922 and 1931, said that of 379 cases of duodenal ulcer treated by gastro-enterostomy 79 per cent were cured. The least favourable cases for operation are subjects below 30 with hyperactive stomachs. In 90 cases of partial gastrectomy for gastric ulcer a complete cure resulted in the great majority. He also made the very interesting statement that in the last six years far more cases of ulcer have been treated medically, but that during that time the number of admissions for perforated ulcer had doubled.

A. M. Cooke gave the experience of 3000 ulcer cases at St. Thomas's Hospital. The total death-rate was 8.9 per cent, which is much higher than Conybeare's estimate, although it must be remembered that as all Cooke's cases were in-patients they were probably the more severe examples of the disease. The recurrence rate was investigated by Thompson in 128 patients who had been

treated medically in the Hospital in the previous five years. It was found that in 38.5 per cent of the cases with gastric ulcer and in 33.3 per cent of the duodenal ulcer cases the lesion had persisted, recurred, or developed anew.

REFERENCES.—¹*Arch. of Internal Med.* 1934, Jan., 97; ²*Amer. Jour. Med. Sci.* 1934, Feb., 246; ³*Lancet*, 1934, April 14, 208; ⁴*Proc. Roy. Soc. Med.* 1934, Jan., 225; ⁵*Acta Med. Scand.* 1923, lviii, 1.

GASTRIC AND DUODENAL ULCER, SURGERY OF. (See also STOMACH, VARIOUS SURGICAL AFFECTIONS OF—GASTRIC OPERATIONS)

A. Rendle Short, M.D., F.R.C.S.

Interest in this subject appears to be waning somewhat, and in view of the enormous amount of literature published during the past ten years this is not surprising. True, numerous papers appeared this year, mostly German, Austrian, and French, but they contained little that has not been put before our readers again and again in recent numbers of the MEDICAL ANNUAL, and British writers have contributed less than usual.

Relation of Gastritis to Ulcer Formation.—In a luminous paper P. W. Aschner and S. Grossman,¹ of New York, set forth the views which are coming to be generally accepted on this subject. They examined microscopically the portions of stomach and duodenum removed, in 124 cases, for gastric or duodenal ulcer, and found inflammatory changes in nearly all, both gastritis and duodenitis. In 38 cases erosions or shallow ulcers were visible to the naked eye, and in 79 cases there were microscopic erosions. The gastritis and duodenitis were sometimes acute, sometimes chronic hypertrophic, sometimes atrophic. They believe that this gastritis and these erosions are responsible for those cases of hæmatemesis in which nothing is found at operation (gastrostaxis), and that gastric and duodenal ulcer never arise in a normal mucosa, but are always preceded by inflammatory changes and erosions. The 'periodicity' of the symptoms of ulcer is due to waxing and waning of the associated gastritis.

Type of Operation.—R. Leriche^{2, 3} contributes two papers on the experience of his clinic at Strasbourg with gastrojejunostomy and partial gastrectomy. In 1925-6, there were 20 gastrojejunostomies and 30 gastrectomies. In 1927-9, there were 50 gastrojejunostomies and 22 gastrectomies. In 1930-2, there were 59 gastrojejunostomies and 44 gastrectomies. The great bulk of the gastro-enterostomies were for duodenal and pyloric ulcer; of the 96 resections, only 14 were for duodenal ulcer. In Leriche's opinion, the "quality of the healing" is better after a resection than after an anastomosis; there is less risk of a gastrojejunal ulcer, and of the subsequent development of carcinoma. He admits that the immediate mortality is higher—14 deaths after 96 resections. For callous duodenal ulcer he practises Finsterer's gastrectomy-for-exclusion. So great is the accuracy of modern radiography that not once in the last eight years has he had a "blank laparotomy".

S. Judine,⁴ of Moscow, deals with the reproach levelled at the gastrectomists that they reserve the operation for the easy cases, and do a gastro-enterostomy when in difficulties. He, at least, is faithful to resection, often a large resection, even in the worst cases. He carries his line of excision of the ulcer right up to the œsophagus, removing the whole length of the lesser curvature; when the anterior and posterior walls of the stomach have been sutured together to reconstitute a new lesser curvature, the stomach comes to be long and tubular.

H. von Haberer, of Cologne, sums up his vast experience in two long articles.⁵ In the main his views accord with those of British surgeons: operation should only be performed when efficient medical treatment has been tried and has failed, or there are complications such as stenosis, perforation, or hæmorrhage.

PLATE XXIII

GASTROSCOPY

(F. MOUTHER)

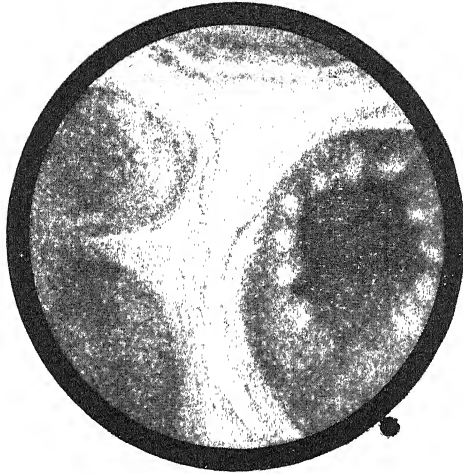


Fig. A.—Pro-antral gastro-enterostomy. Protrusion of the jejunum, bordered by a thick gastric lip.



Fig. B.—Gastro-enterostomy in a sub-antral saccular recess. From below upwards can be seen the gastro-enterostomy with its succulent folds, the antrum with a mammillated surface, the inert, apparently atrophied pylorus, and a dormant ulcer of the lesser curvature.

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PLATE XXIV

GASTROSCOPY—*continued*

(F. MOUTIER)



Fig. C.—Very large pre-antral gastro-enterostomy. The folds of the jejunum are visible, and also an extensive post-operative marginal ulcer.



Fig. D.—Antral gastro-enterostomy invaded by a fungating epithelioma. There is infiltration, deformity, and rigidity of the pylorus.

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Jejunostomy, and mere excision of the ulcer, are not satisfactory. Like most Continental surgeons, he is in favour of the extensive partial gastrectomy, finished either as the Billroth I operation (897 cases), or Billroth II (1598 cases); the former is better if possible, but often the ends will not come together. The death-rate has varied from 2 to 15 per cent. The causes of death were partly avoidable, such as leaking suture-line, digestion of suture-line as a result of injuring the pancreas, and hæmorrhage, which can largely be prevented by tying all the arteries leading to the anastomosis. More difficult to avoid are pneumonia, pulmonary embolism, sudden heart failure due to 'brown atrophy', and acute dilatation of the stomach; this last is very rare.

Recurrent or jejunal ulcer occurred in 0.6 to 0.7 per cent of his cases. About 6 per cent of those operated on gave an unsatisfactory end-result, usually the result of gastritis. Grave secondary anæmia was occasionally met with; it had often been present before operation.

Gastrojejunostomy is only recommended in cases of pyloric stenosis, because the late results are bad. Unilateral exclusion of the pylorus (stomach divided proximal to ulcer, distal part closed, end of stomach united to jejunum), gives even more jejunal ulcers than gastro-enterostomy.

Finsterer's resection-for-exclusion, used for duodenal ulcer, also leads to jejunal ulcer. The only satisfactory treatment for a gastrojejunal ulcer is an extensive partial gastrectomy.

Failures of Gastric Surgery.—The poor opinion physicians and surgeons have of each other's treatment of gastric cases is due to the fact that they both see the other's failures. Dr. J. A. Ryle,⁶ in an address on the surgical failures, included: (1) The formation of a gastrojejunal ulcer (which leaves the patient worse than he was before); (2) Death; (3) Recurrence; and (4) Gastrectomy anæmia, following operation for a *small* lesser-curvature ulcer. He does not blame an ill result after operation for a large ulcer, or for cancer, because to do nothing is unthinkable. Most errors, then, are due to too great haste to open the abdomen, before a trial has been given to medical treatment, or too soon after a hæmatemesis, or in a patient insufficiently prepared. The usual causes of failure, short of death, are a too patent stoma causing overloading of the jejunum, vicious-circle vomiting, peri-anastomotic hæmorrhagic gastritis, persistence of the original ulcer, and gastrojejunal ulcer. After a resection, the failures may be due to recurrence of ulceration or gastrectomy anæmia. For the overloaded jejunum Ryle advises lying down after meals and taking fluids apart from meals; bleeding without pain usually means hæmorrhagic gastritis and calls for large doses of iron. He deprecates any operation in patients who have had symptoms for less than five years. Patients who have bled before operation will probably bleed again after. A. J. Walton⁷ contributed to the discussion, and mentioned the harm of operation when the diagnosis is wrong and no ulcer found; the surgeon should stay his hand unless there is reasonable certainty. In his cases the percentage of errors was 7.2.

Gastroscoy.—F. Moutier⁸ contributes some interesting pictures of the normal and abnormal stoma after a gastrojejunostomy (*Plates XXIII, XXIV*).

Perforated Gastric and Duodenal Ulcer.—The year's literature may be represented by the following papers: J. H. Saint⁹ and J. M. Black¹⁰, both British; L. Rousselin,¹¹ of Lyons; A. M. Graves,¹² presenting a study of results in German clinics; G. K. Rhodes and D. C. Collins,¹³ of Rochester, Minn.; H. K. Shawan,¹⁴ of Detroit; and E. L. Eliason and W. E. Ebeling,¹⁵ of Philadelphia. They show two curious tendencies: the British and American surgeons tend to make the operative treatment simpler, and the Central European to make it more extensive by performing a gastric resection. There is a reason for this. On the Continent ulcers are more frequently multiple,

and the associated gastritis is more severe. Saint and Black advocate simple suture. Rhodes and Collins remark that their follow-up shows about 85 per cent keep reasonably well, and those who have had a gastro-enterostomy are not better in this respect than the simple suture cases. In Shawan's clinic, in the last 132 patients, simple suture alone was used, and a 10 per cent reduction of mortality obtained. The mortality figures vary greatly. The best figures (Gilmour's, quoted by Saint) show a death-rate of only 4.7 per cent out of 64 cases treated by suture alone; Shawan's mortality (227 cases) is 24.2 per cent; Eliason's (72 cases) is 47 per cent. Graves analyses 4258 published cases from German clinics with a death-rate of 68 per cent in 1897 falling to 17 per cent at the present time. The modern tendency in favourable cases is to perform a partial gastrectomy, which may, in such cases, carry a mortality as low as 5 per cent.

All statistics and all experience show, of course, the real time-urgency of a perforated ulcer. Operation under six hours saves nearly all; delayed operation saves very few. There is no condition, except hæmorrhage, in which it is more important for everyone concerned to move quickly.

H. A. Singer,¹⁸ of Chicago, mentions a form of perforation in which there are symptoms of leakage, then a quiet interval, then further evidences of fresh leakage.

Hæmorrhage.—As Eliason and Ebeling¹⁵ point out, one cannot honestly advise immediate surgery in these cases, seeing that the number who die under medical treatment is fewer than those who die after operation for gastric ulcer in the absence of hæmorrhage.

In addition to the usual palliative treatment (absolute rest, morphia, fluids given subcutaneously or intravenously, blood transfusion in bad cases) they use the Jutte tube to drain the stomach. A. W. Allen and E. B. Benedict,¹⁷ of Boston, on the other hand, believe that immediate operation, with blood transfusion, is called for in certain cases. Of patients with gross hæmorrhage, 3 per cent died, but of those with bleeding from a duodenal ulcer, 14.5 per cent, the fatal cases being especially amongst men over fifty. Under fifty, death is rare. The artery is usually in the floor of the ulcer on the pancreas. It should be freely exposed by performing a Polya or Billroth II gastrectomy, opening up the duodenum to expose the ulcer, and ligaturing the feeding artery outside the duodenum before the bowel is closed. [It is not stated how many, if any, patients have been saved by this operation done as an emergency.—A. R. S.]

J. C. McCann¹⁸ advocates "resection by exclusion" as the best operative treatment for massive hæmorrhage from duodenal ulcer, but not until the patient has recovered from the emergency state. In France, as is well known, the usual advice is to operate at once. F. Papin,¹⁹ of Bordeaux, opening a discussion on the subject, stated that the medical mortality is about 15 per cent. The indications for operation are recurrent bleeding, or a diagnosis of ulcer eroding an artery.

M. Wilmoth, of Paris, advises as follows:—

If the stomach is full of blood, but no ulcer can be found: quadruple ligature and either jejunostomy or gastro-enterostomy.

Ulcer found, in stomach wall, not fixed: excision with gastrojejunostomy; if not accessible, cauterization, infolding, or ligature.

Duodenal ulcer, accessible: infolding or excision, gastrojejunostomy.

Deep callous eroding ulcer: partial gastrectomy. Indirect hæmostasis, by tying the main vessels to the stomach and duodenum, may be all that can be safely attempted.

(See also HEMATEMESIS.)

Jejunal Ulcer.—D. P. D. Wilkie²⁰ again warns against gastro-enterostomy in patients with a high acidity; gastroduodenostomy is safer. When jejunal ulcer has occurred the treatment may be gastrectomy, or excision of the stoma and closure of the stomach and jejunum. With gastroduodenostomy secondary duodenal ileus may occur and need a duodenojejunostomy. For gastro-jejuno-colic fistula, a two-stage operation is often best; at the first the transverse colon is doubly divided proximal and distal to the fistula, and the two ends are joined up, with a temporary cæcostomy to relieve tension; later, the ulcer and the loop of colon may be excised together.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, Sept., 334; ²*Lyon chir.* 1933, Sept., 594; ³*Presse méd.* 1933, Aug., 1313; ⁴*Ibid.* Dec., 2079; ⁵*Munch. med. Woch.* 1933, Oct., 1577, 1623; ⁶*Lancet*, 1934, April, 890; ⁷*Ibid.* 893; ⁸*Presse méd.* 1934, April, 653; ⁹*Newcastle Med. Jour.* 1934, Jan., 26; ¹⁰*Brit. Med. Jour.* 1933, Aug., 290; ¹¹*Lyon chir.* 1933, Sept., 543; ¹²*Ann. of Surg.* 1933, Aug., 197; ¹³*Calif. and Western Med.*, 1933, Sept., 173; ¹⁴*Ann. of Surg.* 1933, Aug., 210; ¹⁵*Amer. Jour. Surg.* 1934, April, 63; ¹⁶*Jour. Amer. Med. Assoc.* 1934, Jan., 112; ¹⁷*Ann. of Surg.* 1933, Oct., 736; ¹⁸*New Eng. Jour. Med.* 1934, March, 512; ¹⁹*Presse méd.* 1933, Oct., 1631; ²⁰*Ann. of Surg.* 1934, March, 401.

GERMAN MEASLES. (See RUBELLA.)

GLANDULAR FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—E. J. Bradley¹ records an outbreak of 11 cases of glandular fever in a preparatory school of 84 boys. Two cases were of alarming severity, with marked periadenitis and œdema of the palate and fauces leading in one boy to laryngeal stridor; three others were severe; and the remainder were moderate or mild. The school was disbanded on the fifteenth day after the onset of the epidemic, and only two of the boys sent home developed the disease, both in a mild and attenuated form. Six of the adults attending the boys fell ill, five with frank follicular tonsillitis and one with a doubtful attack of glandular fever. Examination of the blood in selected cases showed a mononuclear leucocytosis which developed after the third day and was well marked at the end of the third week of illness. Unusual complications arose in the shape of an acute retropharyngeal abscess and a cervical abscess. All recovered.

SYMPTOMS AND COMPLICATIONS.—A fatal case of sporadic glandular fever is reported by W. Schwarz² in a male infant, aged 15 months, whose chief symptoms were fever, slight and transient enlargement of the lymphatic glands, spleen, and liver, a leucocytosis of 160,000, and a lymphatic monocytosis of 93 per cent. Repeated blood cultures were negative. Lymphatic leukaemia could be excluded. Death was due to bronchopneumonia.

DIAGNOSIS.—W. W. Bunnell³ used the sheep-cell agglutination test in over 2000 cases of various clinical conditions, and with the exception of serum disease was unable to demonstrate an appreciable increase of heterophil agglutinins for sheep cells in the sera above the normal dilution of 1 to 8. On the other hand, in 15 cases of infective mononucleosis he always found a consistent increase. The titres, ranging from 1 to 64 to 1 to 4096, apparently depended to a certain extent upon the stage of the disease at which the serum was obtained and upon the severity of the attack. None of the common conditions with similar clinical symptoms, such as simple adenitis, tuberculous or syphilitic adenitis, Hodgkin's disease, acute or chronic leukaemia, aplastic anaemia, purpura hemorrhagica, agranulocytic angina, or Vincent's angina, showed an increase in the heterophil agglutinin titre. Bunnell concludes that the test for heterophil agglutinins for sheep cells is a valuable diagnostic method for differentiating infective mononucleosis from a number of much more serious conditions. Cases with a suggestive clinical and blood picture whose blood serum shows an agglutination for sheep cells in a dilution of at least 1 to 64

can safely be diagnosed as infective mononucleosis and a favourable prognosis given.

The value of the test is also confirmed by L. Meigler and R. J. Simelink,⁴ who used it in six cases of clinical glandular fever in patients aged from 2½ to 30, and found it positive in all, whereas in 400 cases of miscellaneous diseases the reaction was negative except in a case of subacute myelogenous leukaemia and one of jaundice due to gall-stones.

REFERENCES.—¹*Brit. Med. Jour.* 1934, i, 752; ²*Pediatrics*, 1934, xlii, 498; ³*Amer. Jour. Med. Sci.* 1933, clxxxvi, 346; ⁴*Nederl. Tijds. v. Geneesk.* 1934, lxxviii, 1952.

GLAUCOMA.

Sir Stewart Duke-Elder, M.D., F.R.C.S.

In an insidious disease like glaucoma early symptoms are of great importance. It has been known for some considerable time that one of the early symptoms is a diminution of the light sense, and an interesting paper by V. Casten and D. Shaad,¹ of Boston, gives statistical evidence of its importance. Records of 40 patients in whom glaucoma developed in the second eye while under observation showed that in 50 per cent the first symptom observed was increased tension (tonometer). In 30 per cent it was a lowered light sense. In 20 per cent changes in the fields or discs were the first symptoms. In the cases with lowered light sense, the adaptation curves showed changes for at least three months before other symptoms were detected, while in some a high threshold had been present for more than a year before other signs of glaucoma. The measurement of the course of dark adaptation is not entirely simple; factors such as pre-exposure and pupillary diameter have to be controlled, and there is a large physiological variation in non-glaucomatous subjects. The results of the test can be regarded, therefore, as suggestive but not conclusive evidence of glaucoma.

Two hundred successive cases which were operated on for glaucoma are reported by A. Knapp,² of New York; the report is interesting since a consideration of the relative efficiency of several alternative operations is best served by the experience of a single writer. The operations practised were the Lagrange, trephining, iridectomy, cyclodialysis, and iridotaxis. The following are his results:—

OPERATION	CASES	FILTRATION	RETURN OF TENSION
Lagrange	95	85	10
Trephining	80	60	20
Iridectomy	12	5	7
Cyclodialysis ..	8	5	3
Iridotaxis	5	5	0

Of 95 Lagrange operations performed, 85 were successful; in 10 cases filtration was not established and tension returned. In 2 of these trephining was then successfully practised, and in 1 cyclodialysis was unsuccessfully resorted to.

Of the 80 trephines, 60 were successful; in 20 cases increased tension returned. In 9 of these last a second trephining was performed, with success in 7 and failure in 2. Cyclodialysis was done in 4 cases, all of which were failures.

Iridectomy was attempted in 12 cases: in 5 of these the tension was reduced, and in 7 it returned. In 2 of these last trephining was carried out, which was successful in one and a failure in the other.

In 5 of 8 cases cyclodialysis reduced the tension; in 3 it failed to do so.

Iridotaxis was performed in 5 cases, all of which did well.

In comparing these results it is to be remembered that the cases operated on by Lagrange's method were specially selected, in that they were early cases with full fields and active irides, in which the tension could be reduced below 35 (Schiötz) with miotics. In patients who did not come into this favourable category, trephining was done as a routine. When this is remembered, it would appear that in the author's hands trephining has given the best consistent results.

Of the cases of trephining, 3 developed late infection, 1 of which was saved by milk injections and subconjunctival injections of cyanide. In 2 cases the trephine blebs ruptured spontaneously; both were remedied by a plastic conjunctival flap. It is generally believed that if a trephine opening remains functioning for a considerable length of time, the opening is permanent: Knapp had one patient who was under observation constantly, in whom the trephine opening closed after eleven years, with a consequent return of the glaucoma necessitating a second trephining. He has found that the prognosis after secondary trephinings is much poorer than after a primary operation, and the more dissection that is done, especially in scar tissue, the less likely is filtration to result.

REFERENCES.—¹*Arch. of Ophthalmol.* 1933, Jan.; ²*Ibid.* x, 298.

GLYCOSURIA. (See DIABETES MELLITUS.)

GOITRE. (See THYROID.)

GONORRHEA. (See also CONJUNCTIVA, DISEASES OF)

Col. L. W. Harrison, D.S.O.

DIAGNOSIS.—I. N. O. Price¹ has further increased the sensitiveness of his method of the gonococcal complement-fixation test, and in a monograph published by the London County Council describes the technique sufficiently closely to enable any trained pathologist to copy it. In his discussion of the clinical application of the test he expresses his belief that a positive reaction indicates a closed or insufficiently draining focus of infection and that a patient with a positive reaction must be regarded as still infectious. This is a view that is held by a number of workers, but there are not wanting others who, while not denying the respect due to a positive reaction or that it calls for further effort to unearth the gonococcus, are not prepared to agree that such a reaction invariably means a focus in the patient.

Amongst the sceptical workers is J. Dörrfel,² whose observations published recently are interesting as evidence of the variations in the length of time the reaction may persist after all signs have disappeared. Dörrfel cites 19 of his own cases in which all tests proved negative with the exception of the complement-fixation reaction. In 10 the reaction gradually faded out in periods varying from 4 to 16 months, but in the remaining 9 it was still positive 2 years later. He recorded 5 cases also in which the reaction had persisted without other sign for 7, 8, 14, 17, and 35 years respectively, and quoted other workers, such as Fröhlich and Jordan, Bruck, Casper, and Lomholt, who have made similar observations as long as 20 to 30 years after cure. In 20 cases with no history of gonorrhœa in which a positive reaction had been provoked by vaccine treatment, 7 were still positive when they passed out of control 1½ to 6 months later. The author remarks that, if the reaction can remain positive so long after a fleeting vaccine treatment, it is not difficult to believe that it could remain much longer after the antigenic agent had acted for weeks or months as in a complicated case of gonorrhœa. It is evident that, although nobody

would lightly disregard a positive reaction in testing a patient for cure of gonorrhœa, it is not justifiable to regard such a reaction as certain proof of the patient's infectiousness.

TREATMENT.—C. M. Carpenter and his colleagues³ made an elaborate experiment to determine the length of exposure to different temperatures required to destroy gonococci. Fifteen strains were tested, seven of them 12 years old, one 10 years, and seven recently isolated. They exposed these strains to temperatures of 40° C., 41° C., 41.5° C., and 42° C. respectively, and hourly tested a sample of each for viability. The practical result of their investigation was that the destruction of 99.9 per cent of the gonococci required four hours at 41° C. and two hours at 41.5° C. With regard to the application of their findings to the treatment of gonorrhœa, a temperature of 41.5° C., induced by high-frequency currents or by short-wave (30 metres) radiation, is the maximum to which a patient can safely be subjected for five hours. The authors think that, "the abnormal environment resulting from artificial cultivation cannot be more injurious to the gonococcus than the natural defensive agents of the body, other than fever", and conclude that the artificial induction of fever is likely to prove a valuable form of treatment of gonococcal infections.

T. Grüneberg and G. Liebmann,⁴ in acute cases of gonorrhœa, have compared three methods, fever produced by intravenous injection of *pyrifer*, fever and possibly immune body produced by intravenous injection of gonococcal vaccine (*arithgon*), and only local treatment. They insist on the necessity of local treatment in the fever-treated cases, and on this condition found that in purely superficial anterior gonorrhœa quite definitely a non-specific fever, produced with *pyrifer* (200 to 800 units with temperatures of 38.5° to 41° C. twice weekly), shortened the duration of the attack, but *arithgon* (30 to 1400 millions, producing temperatures of 37.5° to 39° C.) seemed to be without particular effect. In cases a little more advanced, however, with some posterior urethritis and slight prostatitis the vaccine had an advantage over purely local treatment, and this although the temperature produced was only 37.5° to 39° C.

E. Hughes and C. A. Birch⁵ report on the treatment of 50 cases of gonorrhœa by intravenous or deep subcutaneous injection of *acriflavine*. The subcutaneous route was abandoned early on account of the pain it caused and the occurrence of abscesses in two cases. For intravenous injection they used 10 c.c. of a 1 per cent solution three times a week. The authors found that, although in favourable cases the discharge might cease quickly, relapses were frequent and the total number of days under treatment was not reduced. The drug caused liver damage in some cases, and because of this, with the experience of other workers to the same effect, the authors have abandoned it.

R. S. Statham⁶ reports again on the treatment of gonorrhœa in women by swabbing with 1 per cent *mercurochrome*. His first paper on the subject was about six years previously, and the present relates to an experience of 450 cases treated during the past five years. The method is to apply 1 per cent *mercurochrome* to the cervix and vagina whilst the latter is kept fully stretched by a fenestrated speculum. The application is preceded by a warm saline douche followed by swabbing to remove pus and mucus. In cases of urethritis the urethra is irrigated. The author deprecates the use of solutions stronger than 1 per cent, saying that they afford no advantage and there is some evidence to show that solutions stronger than 2 per cent tend to cause erosions. He recommends that douching should be stopped as early as possible in cases of cervicitis. He says, "An 'erosion' will cause a mild discharge which is aggravated as long as hot douching is in use." He adds that in most of the cases in which the discharge has been kept up by this cause, "stopping the douche, and application of the cautery, will effect a cure in a few days." The test of

cure, applied after cessation of treatment, was a negative set of smears and cultures from cervix and urethra after each of three successive menstrual periods, and a negative complement-fixation test. The average duration of treatment to the first of the final set of negative tests was 37.2 days (longest 94 days, in one case, and shortest 8 days, in two cases). Any cervical erosions seen after the second negative smear were cauterized, radiating lines being drawn with the cautery outwards from the cervical canal. The author's table shows that in 7 of the 16 cases so treated only two, and in 5 others only three, applications were necessary. For salpingitis in women who have never become pregnant the author blames interference with the cervical canal by passing probes up it. He says, "This complication is known to be very rare in women who have never become pregnant, for the reason that while the internal os remains intact it is almost impervious to any organism." Also, "Any method of treatment entailing passing of instruments through the internal os is to be condemned as strongly as possible."

REFERENCES.—¹*The Complement-fixation Test for Gonorrhœa and its Clinical Application*, 1933, London County Council; ²*Arch. f. Dermatol. u. Syph.* 1933, clxix, 421; ³*Jour. Lab. and Clin. Med.* 1933, xviii, 981; ⁴*Münch. med. Woch.* 1933, Nov. 17, 1820; ⁵*Lancet*, 1933, Sept. 16, 633; ⁶*Brit. Med. Jour.* 1934, i, 607.

GRANULOMA COCCIDIODES. (See SKIN, FUNGUS INFECTIONS OF.)

GRANULOMA INGUINALE. (See also LYMPHOGRANULOMA INGUINALE; RECTUM AND ANUS, DISEASES OF.)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—W. A. De Monbruen and E. W. Goodpasture¹ discuss the etiology of this disease, and report on their bacteriological investigations by inoculating small fragments of the granulation tissue rich in Donovan organisms, after repeated washing in saline solution to remove as far as possible secondary bacteria, on the surfaces of chick membranes which had been incubated for eight to twelve days, and applying a coverslip sealed with a ring of vaseline-paraffin mixture to enable the result to be watched during further incubation at 37° C., and small bits to be removed for examination, and subcultures to be made on rabbit-blood agar. Cultures of small Gram-negative diplobacilli were thus obtained in two out of five cases, but were difficult to maintain on further subculture. They proved to be non-pathogenic for small animals, chiefly guinea-pigs, apart from the production of small abscesses which soon healed, and no structures resembling Donovan bodies were seen in the lesions. On the other hand, many of the bacilli in the cultures possessed capsules and were morphologically identical with Donovan bodies, and this they consider lends weight to the view that the two organisms are the same and that successful cultures have been made. The authors have also cultivated a similar organism from the feces of two out of four cases of granuloma inguinale, and they suggest that the disease is primarily a chronic intestinal infection of the neighbouring skin and mucous membranes from constant contamination with infected feces.

REFERENCE.—¹*Amer. Jour. Trop. Med.*, 1933, Sept., 447.

GRAVES' DISEASE. (See THYROID.)

HÆMATEMESIS.

Robert Hutchison, M.D., F.R.C.P.

This subject continues to attract a great deal of attention, and some important papers have been published on it since the summary in the MEDICAL ANNUAL for last year (p. 207).

G. Burger and S. Hartfall¹ have reported upon the cases of severe hæmatemesis from peptic ulcer admitted to Guy's Hospital during the period 1921-30 inclusive.

There were 137 cases due to acute or chronic ulcer, with a mortality of 22.6 per cent. Gastric ulcer was three times as common as duodenal as a cause of severe hæmatemesis. Males were affected more than twice as often as females in this series, and the mortality in them was three times as great. Ulcer, acute or chronic, accounted for over 77 per cent of the cases of hæmatemesis admitted. [This is very different from the West London Hospital statistics, referred to in the article in last year's ANNUAL (p. 207).—R. H.] The writers agree with the general view that recurrence of the bleeding within a few days is the most serious prognostic sign. Cases with two or three recurrences had a three times, and cases with four or more recurrences had an eight times, less chance of recovery than those with only one bleeding. When the bleedings followed at short intervals the outlook was better than when the intervals were longer.

R. S. Aitken² has studied 255 cases admitted to the London Hospital on account of recent hæmatemesis or melæna or in which a significant amount of bleeding occurred after admission on other grounds. The mortality of all cases was 11 per cent, but of the *severe* cases something between one-fourth and one-half ended fatally; this high death-rate tends to be obscured by the common method of expressing the death-rate as a percentage of *all* cases, both mild and severe.

In a joint discussion at the Royal Society of Medicine³ G. Gordon-Taylor stated that the mortality from hæmatemesis in cases of chronic ulcer treated medically at the Middlesex Hospital was 24 per cent; if a second large hæmorrhage occurred, the mortality rose to 78 per cent. John Morley said that in 330 cases of bleeding from acute ulcer treated in Manchester Royal Infirmary the mortality was 12.2 per cent, and of all cases of chronic ulcer admitted for hæmorrhage about 10 per cent died.

TREATMENT.—Aitken makes the following recommendations based upon experience at the London Hospital:—

1. A distinction should be made, clinically, between grave cases and less severe ones. Recurrent bleeding is often but not always grave. Cases in which the red cells fall below 2,000,000 or the hæmoglobin below 40 per cent (on a scale on which the normal is 100 per cent) will usually be grave. The distinction is to be made, however, on consideration of the whole clinical picture.
2. The less severe cases should be treated on the accepted medical lines.
3. The grave cases should be treated medically, in bed, with sufficient morphia to ensure complete rest; and a transfusion of about 500 c.c. of blood should be given, without moving the patient from his bed, after careful cross-grouping.
4. If further bleeding is indicated by subsequent hæmatemesis or rising pulse-rate, the transfusion should be repeated once or twice within the next twenty-four to forty-eight hours, or when necessary.
5. If bleeding still continues and the patient's condition deteriorates, operation should be promptly undertaken, along with a further transfusion. The operation should probably be restricted to the minimum procedure necessary to find and secure the bleeding point.

There is general agreement that there should be closer co-operation between physician and surgeon in the treatment of hæmorrhage from chronic ulcer, as it is in these cases alone that operation may be called for, but Izod Bennett regards the moving of cases of hæmatemesis to hospital as involving considerable risk.

(See also GASTRIC AND DUODENAL ULCER.)

REFERENCES.—¹*Guy's Hosp. Rep.* 1934, lxxiv, April, 197; ²*Lancet*, 1934, April 21, 839; ³*Ibid.* March 17, 572.

HÆMORRHAGE, POST-PARTUM. (See LABOUR AND ITS COMPLICATIONS.)

PLATE XXV

POST-TRAUMATIC EPIDERMOID CYSTS

(E. S. J. KING)



Fig. A.—Drawing of the hand showing an epidermoid cyst of the hypothenar eminence.



Fig. B.—Drawing of a foot showing a typical epidermoid cyst.



Fig. C.—Drawing of the left hand showing a lobulated and fluctuant cyst.



Fig. D.—Drawing of the hand showing two cysts. The cyst in the terminal portion of the first finger developed after a perforating injury, and that in the proximal portion of the ring finger after non-perforating trauma.

HANDS AND FINGERS, SURGICAL AFFECTIONS OF.*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Septic Hands.—R. Rutherford¹ discusses the unsatisfactory method of treatment by: (1) Fomentation; (2) Incision and drainage; (3) Hot baths. The incision should be a considered one and an adequate one along the lines recommended by Kanavel. When the incisions are made Rutherford recommends that the hand be dressed with a large lump of sterile vaseline laid on the wound at least an inch thick and continued wide of the incision; gauze and wool are applied and kept in position by means of a bandage. The dressings are left untouched for a week, with the proviso that the temperature is taken daily and an inquiry made with regard to the presence of pain. At the end of a week the dressing is removed. At first sight the hand looks very dirty, with a mixture of pus, blood, and vaseline; on cleaning, however, it is seen that the skin is soft and supple, and the wound edges are fresh and clean. There is an entire absence of that white, macerated, podgy appearance too often seen as a result of hypertonic baths and wet dressings. The hand is again dressed with a mass of sterile vaseline in precisely the same fashion as before, and left for another week. Healing is usually complete at the end of the third week. There is a soft skin and a supple painless scar.

Post-traumatic Epidermoid Cysts of Hands and Fingers (*Plate XXV*).—E. S. J. King² states that cysts lined in part by squamous epithelium occurring on the palm of the hand and fingers and more rarely on the sole of the feet and on the scalp have been recognized as a clinical entity for over half a century. They are frequently termed implantation cysts or implantation dermoids. There is little support for this terminology. He gives the following summary: (1) Cysts of the palmar aspect of the hand and fingers arising after trauma and lined by squamous epithelium are common. (2) The trauma is not necessarily of perforating character; jarring injuries produce a similar result. In a certain number of cases no history of injury is obtainable. (3) There is usually a latent period between the injury and the development of a cyst. (4) The term 'post-traumatic epidermoid cyst' is suggested as emphasizing this feature. (5) The cyst often develops rapidly once it commences. (6) The cysts are benign and easily removed. (7) The squamous epithelium lining them, in the majority of cases, does not arise by implantation from the skin.

REFERENCES.—¹*Med. Press and Circ.* 1934, April 18, 359; ²*Brit. Jour. Surg.* 1933, xxi, July, 29.

HARE-LIP AND CLEFT PALATE. *John Fraser, Ch.M., F.R.C.S.Ed.*

Hare-lip.—The developmental process which results in the formation of the upper lip has been the subject of much research by embryologists, and those who are interested in the problem have been accustomed to accept the well-established views; it is somewhat disconcerting, therefore, to find Denis Browne¹ advancing what may be regarded as a new conception of the process. His view, as we read it, is that the lateral processes of the lip override the central process—that, in other words, the central process forms but a small lozenge-shaped segment of the upper lip tissue, the entire red line being formed by the fusion of the lateral processes. Browne advances evidence in support of his contention, and it may be that he is correct, though his teaching is contrary to that of the majority of embryologists.

In the plastic operation for the correction of hare-lip the author is averse from any procedure which necessitates the cutting of flaps unless it be the making of small flaps at the mucocutaneous junction in order to ensure the normal prominence of the lip at the point of suture. The flaps are cut by an

ingenious method: using a 2-mm. ophthalmic trephine, he cuts out the necessary segment, supporting the deep surface by means of a small strip of sterile wood, and the cleft edges are excised by incisions which run parallel to them. The obvious criticism arises that by such means it must be difficult to avoid undue tension unless an unusual degree of undercutting and loosening is secured. This detail is not alluded to in the article.

Cleft Palate.—The operation of pharyngoplasty introduced by W. E. M. Wardill in 1928, and reviewed in the *MEDICAL ANNUAL* in 1930 (p. 124), is the subject of another article from his pen—the text of the Hunterian Lecture of 1933.² The article contains an excellent description of the physiology of speech, together with a most helpful account of the various phonetic errors which arise in association with palate defects. The anatomy of the nasopharyngeal valve is fully described. It will be recalled that Wardill attempts to improve the efficiency of this structure when a cleft exists by carrying out a plastic operation on the posterior wall of the pharynx, the result being to produce a local and mid-line prominence which acts as an exaggerated Passavant's ridge (the upper fibres of the superior constrictor muscle of the pharynx). The details of the operation are fully explained, but as these have already been the subject of a review, they need not be repeated.

Wardill is now able to present the results of 72 operations. The mortality figure is given as 3 per cent, and it is important to recognize the factors which were responsible for the disasters. They were retropharyngeal and mediastinal cellulitis, heart failure during operation, and asphyxia during the immediate post-operative period. The last appears to be the greatest risk of the operation, and Wardill states that it can be avoided by retaining the endotracheal catheter *in situ* until the reflexes have returned.

In estimating the results of the operation Wardill describes various tests by means of which he judges the functional result in so far as the nasopharyngeal valve efficiency is concerned. These are the 'snorting' test, ability to extinguish a candle, inflation of a rubber balloon, nasal irrigation, the stethoscope test, and a somewhat complicated method which implies the collection and the estimation of the oral and nasal air escapes; in addition, of course, he takes into consideration the character of the speech. In this connection he points out an interesting feature which is not commonly recognized. Those who suffer from cleft palate attempt to lessen their speech disability in the pronunciation of consonants by two procedures: by placing the tongue tip immediately behind the alveolar margin and then allowing the explosive effort to take place as the tongue is suddenly withdrawn, or by closing the glottis and placing tongue, teeth, lips, etc., in their more or less correct relations, and thereafter releasing the glottis suddenly to permit the escape of the air and formation of the sound. By such means, and dependent upon the efficiency with which the ruse is carried out, a wonderfully correct reproduction of consonants is possible. Wardill reminds us that the first group offers the best field from the point of view of post-operative results; the second is also good provided that the patient is capable of abandoning the glottic stop when the need for it no longer exists. He recognizes a third class, who, on account of deficiency of hearing or intelligence, pronounce consonants as vowels; this group is unpromising, however great may be the technical success of the operation.

It is agreed that accuracy of speech production must be the standard by which surgical results are judged, and on this understanding Wardill presents his experience of 55 cases. We cannot undertake to discuss the full record of his analysis, but briefly stated it comes to this, that in 6 instances the results were bad, in 32 cases the speech was relatively normal, and of this number 19 were provided with fully competent valves, in 17 instances the patients

were too young or the operation was too recent to permit the estimation of results. We must agree that a record of this character is extremely satisfactory. The operation of pharyngoplasty has not been widely adopted hitherto, but we believe that this paper will stimulate interest in the procedure. It is understood, of course, that in addition to the pharyngoplasty a repair of the cleft palate is also ensured.

Wardill has published an abbreviated account of the operation and results in the *Archiv für klinische Chirurgie*.³

Victor Veau,⁴ who has vast experience in cleft palate surgery, records a further analysis of his results. It may be recalled that the MEDICAL ANNUAL reviewed his analysis of 1000 cleft palate operations in 1930 (p. 265); at the present time 539 subjects form the basis of the communication. He divides the cases into three groups: (1) Those capable of perfectly normal speech, not only to the untrained ear but to those who are phonetic experts; (2) Those who are able to pronounce all the consonants, but who add certain sounds such as the nasal snuffle and twang; (3) Those who are incapable of pronouncing certain consonants such as *p, t, k*, or *ch, s, j*, and *z*. In the original analysis of 1000 cases published in 1929, 35 per cent were reported as normal. Veau points out that a subsequent investigation raised this number to 43 per cent, and that at a later date "the percentage fell to 40 per cent." It is interesting to notice that the 3 per cent who lapsed had been the subjects of operation for adenoids, and Veau claims that this procedure destroyed for the time being the efficiency of the nasopharyngeal valve. In the present analysis an additional 100 cases are considered, and the results are contrasted with those previously reported. In the present series the normal figure has risen from 40 to 62 per cent, and Veau attributes the improvement to the stitching of the pillars of the palate, a step which he now includes in the detail of the operation.

Veau presents a second feature of the analysis in this instance in respect of age. This general finding is stated: that when a child is operated on successfully before the end of the third year the prospect of satisfactory pronunciation is in the neighbourhood of 98.6 per cent, while in subjects operated on after this date the figure falls to 60 per cent. The truth of the contention that the results of early operation are better than those encountered in late cases is generally accepted, but hitherto no one has ventured to establish the contention on such definite statistical claims.

In so far as the operative technique is concerned, we have encountered two suggestions designed to modify the technique, both connected with the principle of tension relief sutures. H. Pichler,⁵ after closing the nasal surface of the soft palate, inserts a tension suture which encircles the musculature and secures a broad coaptation of the raw surfaces. Apart from that detail, Pichler practices the Veau technique, and particularly that part of it which entails suture of the mucosa on the nasal surface of the cleft.

Denis Browne¹ recommends the use of what is actually a purse-string suture. He states that it passes round the entire nasopharyngeal sphincter deep to the mucosa, emerging through the raw area of the soft palate on each side. The suture is of 40-day No. 1 catgut inserted by means of a five-eighths circle needle; it is passed as soon as the edges of the cleft have been made raw, and tied when the nasal mucosa has been sutured. The suture narrows the nasopharynx as much as the surgeon considers advisable; Browne suggests a diameter of $\frac{1}{4}$ in. After the stitch has been knotted, a similar ring suture is made with its two ends, these being passed into the cut that has freed the sphincter on either side. There they pick up the tendon of the tensor palati, and ultimately they are tied so as to approximate in some degree the tensor

palati tendons and the other elements of the sphincters. The details are shown in *Figs. 20, 21*. Browne believes that the procedure has advantages over any other method of uniting the soft palate and of counteracting tension upon the suture line.

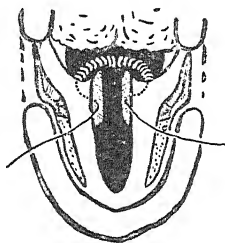


Fig. 20.—Diagram of the insertion of the circular suture in the line of the sphincter which is recommended. It can be seen entering the raw surface of the soft palate, passing completely round the pharynx under the mucosa, and emerging through the raw surface of the opposite side.

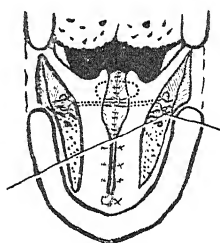


Fig. 21.—Diagram of the suturing of the ends of the tensors of the palate. The circular suture has been drawn tight and knotted, and its ends passed round the tendinous expansion of the tensors on either side. It will be drawn tight and knotted in its turn, taking all strain off the sutures that adjust the mucosa.

(By kind permission of the 'Practitioner'.)

REFERENCES.—¹*Practitioner*, 1934, June, 658; ²*Brit. Jour. Surg.* 1933, Oct., 347; ³*Arch. f. klin. Chir.* 1933, Oct., 504; ⁴*Bull. et Mém. Soc. nat. de Chir.* 1933, Nov. 25, 1372; ⁵*Wien. klin. Woch.* 1934, Jan. 19, 70.

HAY FEVER. (See ASTHMA AND HAY FEVER.)

HEAD INJURIES.

Geoffrey Jefferson, M.S., F.R.C.S.

Views as to the treatment of head injuries have changed, as pointed out by the present writer in his Review of Neurosurgery in the *Ten-Year Index* to the MEDICAL ANNUAL. Apart from suspicion of intracranial hæmorrhage there is very little indication for operation in these cases. Donald Munro¹ states that he has found 37 subdural hæmorrhages in 201 injuries. There is no doubt that such hæmorrhages are far from uncommon, but often they are so small that they have little or no influence on the result. The only really good cases for operation are those in which the clot is large and the other brain injuries negligible. As has long been known ever since W. H. Bowen's classic paper, there may be a very long latent period between injury and signs of clot compression. Equally it is becoming clear that a number of these cases are not diagnosed or are misinterpreted because there is a great tendency for the symptoms to take psychotic forms, and in old people particularly these may easily be attributed to such things as senile dementia, cerebral arteriosclerosis, and so forth. Some new work on the cause of the latent period calls for comment. It has long been known that the clot in the subdural hæmatomas was curiously liquid, and the problem of the variable and often latent period has long remained unsolved. Gardner believes that there is a physico-chemical explanation. The original clot becomes surrounded by a fine arachnoidal membrane [this is correct], and this, according to Gardner, acts as an osmotic barrier through which cerebrospinal fluid slowly dialyses. The length of the latent period depends, then, on: (1) The original size of the clot; (2) The thickness and nature of the organized membrane; (3) The accessibility of the cerebrospinal fluid; and perhaps the extent of the original admixture with the blood. This is an important idea and is more probable than the older beliefs of gradually increasing venous bleeding or such views as those of Wertheimer,

Dechaume, and Verrière. The last-named authors thought that the old clot became vascularized, and that secondary bleeding occurred from the new vessels, a most unlikely happening.

Jefferson Browder² believes that lumbar air injections are helpful in clearing up the diagnosis in difficult cases, and says from his experience of it that no harm accrues. Twelve times he has injected 50 to 60 c.c. of air, and three times demonstrated a clot which would not otherwise have been discovered. (*See also CEREBRAL PNEUMOGRAPHY.*)

The reviewer describes his own views on head injuries,³ pointing out the frequency of neurological signs of local cerebral damage. All that is necessary is careful clinical observation instead of doing what is too often done—namely, assuming that in an unconscious patient nothing is to be made out except unconsciousness. Many quite fascinating clinical signs can be discovered in the various traumatic states, and an attempt is made to clarify the position by dividing the picture into that of the basic state and the epiphenomena. The first represents the state of plain contusion, the second the signs of local damage of particular areas laid down on top of it. Some such recognition is important for the correct diagnosis of head injuries and for guidance in their treatment.

(*See also EAR, AFFECTIONS OF—DEAFNESS.*)

REFERENCES.—¹*New Eng. Jour. Med.* 1934, cex, 1145; ²*Arch. of Neurol. and Psychiat.* 1934, xxxii, 899; ³*Brit. Med. Jour.* 1933, Nov.

HEAD INJURIES, AFTER-EFFECTS OF. (*See also NERVOUS DISEASE IN BOXERS.*) *Macdonald Critchley, M.D., F.R.C.P.*

The great importance of the post-concussional syndrome as a problem in industrial medicine and in treatment, is daily increasing. A recent paper by W. Ritchie Russell¹ is for this reason of considerable interest and utility. Russell has based his remarks upon a follow-up study of 200 cases of head injury, personally observed during the acute stage and also after an interval averaging eighteen months. Of the 200 cases, 120 (60 per cent) developed post-concussional symptoms. The proportion of patients with head injury who subsequently developed symptoms increased with age; thus the proportion developing sequelæ varied from 46 per cent in the case of adolescents between 10 and 20, to 52 per cent for patients in the age period 20-30; 60 per cent in the period 30-40; 77 per cent in the case of those between 40 and 50; while 100 per cent of patients over the age of 50 developed a post-concussional syndrome. Not only is the incidence of sequelæ greater in later life, but there is a greater tendency for symptoms to persist—that is to say, the power of recovery from post-concussional symptoms is less in the later age-groups. This statement is illustrated in *Table I*, taken from the author's paper:—

Table I.

DURATION OF AFTER-EFFECTS	TOTAL (120 CASES)	AGE PERIODS					
		0-10 (19 Cases)	10-20 (20 Cases)	20-30 (34 Cases)	30-40 (15 Cases)	40-50 (14 Cases)	Over 50 (18 Cases)
Months	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per cent	Per Cent
2-6	9	16	10	15	0	7	0
6-18	25	42	25	23	20	21	17
Over 18	66	42	65	62	80	72	83

It may be said, regarding the individual symptoms, that headache is the commonest complaint, occurring in 42 per cent of the whole series of 200 cases. Dizziness comes next, occurring in 29 per cent of the whole, but in 61 per cent

of those the patients were over 50 years. Impairment of memory and of mental ability was present in 25 per cent, and again was much commoner in the elderly (67 per cent over 50 years). Nervousness was complained of in 23 per cent, and disturbance of personality was noted in 18 per cent. These last two symptoms were commoner in children. Sleeplessness was a symptom in 12 per cent, but usually continued only for a few months. Among the rarer sequelæ may be mentioned unilateral partial deafness (8·5 per cent). Epilepsy developed in 7 cases (3·5 per cent), the fits commencing at an interval from six to eighteen months after the injury.

The question as to capability of resuming work constitutes a medico-legal problem of great difficulty and importance. Of Russell's 200 patients, 139 were working men or women; of these, 79 per cent were able to return to full work within six months of their accident. Here the factor of compensation proves an important and deleterious complication: 30 per cent of the compensation cases reported unfit for full work eighteen months after the accident, whereas the figure for the non-compensation cases was only 9 per cent. It must be remembered, however, that many of the non-compensation cases returned to work before they were fit.

The relationship between the age of the patient and the duration of convalescence is an intimate one. Thus, at the end of eighteen months, the proportion of patients between the ages of 15 and 30 unable to work was 6 per cent; between 30 and 50, 21 per cent; and over 50 the figure was 46 per cent.

Russell also considers the question of the severity of the original accident in its effect upon determining the length of incapability. Taking as his index

Table II.

PERIOD OF FULL WORK	DURATION OF LOSS OF FULL CONSCIOUSNESS							
	0-1 hour		1-24 hours		24-72 hours		Over 72 hours	
Months		C.		C.		C.		C.
0-2	32	5	27	3	2	0	4	0
2-6	5	6	6	2	3	0	14	1
6-18	2	2	3	0	0	0	3	0
Over 18	2	7	3	1	0	0	6	0
	41	20	39	6	5	0	27	1
Totals (139 cases)	61		45		5		28	

Table III.

PERIOD OF FULL WORK	DURATION OF LOSS OF FULL CONSCIOUSNESS							
	0-1 hour		1-24 hours		24-72 hours		Over 72 hours	
Months		C.		C.		C.		C.
0-2	30	3	23	2	2	0	4	0
2-6	1	6	5	2	3	0	13	1
6-18	1	1	3	0	0	0	3	0
Over 18	0	3	1	0	0	0	3	0
	32	13	32	4	5	0	23	1
Totals (110 cases)	45		36		5		24	

Compensation cases are shown separately in columns marked C.

the duration of the unconsciousness, the author finds that there is some degree of relationship between the severity of the trauma and the duration of the convalescence. On the other hand, a high proportion of the severely injured cases were able to return to work within six months. This statement particularly applied if the older patients are excluded from consideration. *Tables II and III* illustrate not only this point, but also testify to the operation of the compensation-factor. *Table III* is similar to *Table II*, but all cases over the age of forty are excluded.

Thus of the cases where the initial unconsciousness was less than one hour there were 20 compensation cases and 41 non-compensation cases. Of these, 7 and 2 respectively reported unfit for full work eighteen months after the injury.

In 95 cases, an X-ray examination was made of the skull. It was found that the presence or absence of fracture of the skull is not important in respect of ultimate outlook. The proportion of cases incapacitated by injury is the same in the cases with fracture as those without.

TREATMENT.—Russell emphasizes that an anxiety state frequently coexists, and may often be cured by simple reassurance. The presence of a compensation factor, however, complicates the cure. Light work should be provided before full work is attempted. It should be pointed out to the employee that an attempt to start work does not invalidate his right to claim in the future. Sometimes it is difficult to decide whether or not a patient is really making an effort to recover. The author suggests that such a patient might be admitted to a hospital ward for strict Weir-Mitchell régime. The genuine patient will always improve and will not complain, while the malingerer will not submit for long. In many cases rest in bed promptly relieves the symptoms. Trotter's dehydration treatment is useful and the patient may gain relief by sitting up in the Fowler position by night as well as by day. Gradually increasing exercise should be ordered, but should be curtailed promptly if severe symptoms recur. Bromides and luminal are useful in those cases with irritability and intolerance to noise.

REFERENCE.—¹*Edin. Med. Jour.* 1934, xli, 129.

HEADACHE AFTER LUMBAR PUNCTURE. (See LUMBAR PUNCTURE.)

HEADACHES OF PITUITARY ORIGIN.

Sir Stewart Duke-Elder, M.D., F.R.C.S.

A paper by B. Cushman¹ is interesting in that it throws some light upon those obscure cases of headaches which frequently bring patients to the practitioner and the ophthalmologist. In several such cases wherein a correction of the refraction error led to no improvement and the symptoms were definitely referable to the eyes, an investigation into the function of the pituitary gland led to its arraignment as the causal factor. The typical symptoms were headaches localized behind the eyes coming on in periodic attacks, and discomfort of the eyes themselves resembling ciliary spasm. Such cases deserve careful study of their visual fields, and pituitary involvement—either dysfunction of a normal gland, or a distension of the capsule due to physiological hypertrophy—may be inferred if they show a contraction of the superior temporal quadrant for colour. The author recommends medication by pituitary extract and local X-ray treatment, the latter especially having proved most satisfactory, an opinion which "need not be adhered to as a finality because of the paucity of cases."

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1933, ci, 837.

HEART DISEASE. (See also ANGINA PECTORIS; ARRHYTHMIAS; CORONARY ARTERY DISEASE; ELECTROCARDIOGRAPHY; SYPHILIS, CARDIOVASCULAR; THYROID HEART.) *A. G. Gibson, M.D., F.R.C.P.*

C. B. Perry¹ has followed up the results of the scheme initiated by the late Dr. Carey Coombs in the inquiry into the *etiological factors in heart disease* in various centres in Great Britain and Ireland on the method that he adopted for the Bristol General Hospital, and includes, as stated in last year's MEDICAL ANNUAL (p. 217), the following groups: Congenital, rheumatic, ulcerative endocarditis, syphilitic, thyrotoxic, hyperpiesis, senile cardiac sclerosis, and functional. There is some variation in the percentage from different centres. Thus Middlesex Hospital would appear to have only 16.5 per cent of rheumatic cases, whereas Glasgow has 43.5 per cent, and the Heart Hospital 47.6 per cent. This would, however, appear to be the result of the exclusion or inclusion of rheumatic disease in children. Probably, however, these local variations counteract one another, and the final percentage amongst a total of 2680 cases gives a reasonably accurate result as it affects these islands. Rheumatic heart disease is easily first with 38.4 per cent, senile cardiosclerosis comes next with 19.1 per cent, hyperpiesis with 12.7 per cent, and thyrotoxic with 10.7 per cent. All the rest are below 10 per cent, and syphilitic heart disease on the average is 6.5 per cent, though it rises above the 10 per cent in certain seaports, namely, Aberdeen 12.5 per cent, Newcastle 11.6 per cent, and Cardiff 11.3 per cent.

Adiposity of the heart is defined by H. L. Smith and F. A. Willius² as an increase in the amount of sub-epicardial fat together with the penetration of fat along the connective-tissue bundles in amongst the muscle fibres. It is the same as the fatty infiltration of older morbid anatomists. They deal with 136 patients with post-mortem examinations; in all the body weight was increased 13 per cent or more. There is a very full investigation of possible factors, but the conclusions are that the part played by adiposity of the heart in the production of cardiac failure is that of adding a burden to some other disease such as hypertension or coronary sclerosis, and therefore that any cardiac disease is distinctly more serious if cardiac adiposity is present. In some instances cardiac adiposity in itself is responsible for cardiac failure. There are probably both local and general factors. The penetration of fat into the muscle bundles and even into the papillary muscles may impair the function of the muscle fibres. General obesity tends to produce cardiac impairment by throwing an increased amount of work on the heart. There is an excessive amount of tissue to be nourished, for fatty tissue is vascular, and the amount of work required for bodily exertion is greater than in thin persons. The metabolic level of these patients is increased. Corresponding to this there is an increase in the weight of the heart compared with subjects of normal weight. This increase is apparently a physiological necessity. Nevertheless, in some cases the actual weight of the heart was less than the calculated weight. This in itself may be the cause of circulatory inadequacy which is frequently seen in these cases. Cardiac obesity as here defined must be clearly distinguished from the fat deposited inside the fibres of the muscle in such conditions as diphtheria.

C. L. Laws and S. A. Levine³ sum up their conclusions on *rheumatism in heart disease with reference to the cause of death*. Of 148 cases 33.1 per cent died of congestive cardiac failure, 29 per cent of subacute bacterial endocarditis, 23 per cent of acute rheumatic carditis, and 11.5 per cent of peripheral emboli and thromboses; 3.4 per cent died of various cardiovascular accidents such as angina pectoris or acute pulmonary oedema. The average age at death in aortic valvular disease alone was 52.5 years, in mitral disease 42.8 years, and in those with a combination of aortic, mitral, and tricuspid 30 to 35 years.

Twice as many females died of acute rheumatic carditis as males. In speaking of aortic and mitral disease the authors refer mainly to aortic and mitral stenosis. The embolic group was almost invariably accompanied by auricular fibrillation.

J. M. Cowan⁴ gives some useful suggestions on *prognosis in chronic heart disease*. The grave significance of almost any other disease, especially infective diseases, upon chronic heart disease is noted. A valuable method is to compare observations made from time to time on the same patient, such as progressive increase in cardiac size, variations in the level of the blood-pressure, and the reactions of the patient to exercise, both in sport and in the course of his daily routine. The appearance of pulsus alternans identified from the sphygmomanometer also gives a hint of warning. The author also refers to changes in the electrocardiogram which a routine investigation may reveal. The change in the relative predominance of the right and left sides of the heart may also be of value in showing that an adjustment of the cardiovascular function is taking place. The history obtainable both from the patient and his friends is often significant, such as the gradual relaxation of effort, the missing out of items in the day which involve exertion, changes in temperament, and especially inability to control temper.

In speaking of the incidence of *cardiovascular disease in diabetes mellitus* J. W. Sherrill⁵ records that Bowen and Koenig, in a group of 162 patients over 40, found that 63 per cent showed X-ray evidence of arteriosclerosis, whereas in a corresponding series who were non-diabetic 28 per cent alone showed such evidence. His conclusions are that while untreated or improperly treated diabetics tend to suffer from arterial changes, treatment on rational lines will prevent this development. He is against the use of excessive carbohydrate with its high insulin dosage and alternating hyperglycæmia. Such treatment is especially to be avoided when the patient is already arteriosclerotic or suffering from hypertensive heart disease. The sudden fall in circulating blood-sugar with each dose of insulin is thought to damage the myocardium. Sherrill encountered 16 cases of angina pectoris (3.8 per cent) and 10 cases of coronary occlusion (2.4 per cent) in 225 cases of diabetes. Including hypertensive disease, 13.6 per cent of the cases had heart complications.

W. G. Harrison, jun.,⁶ finds that the *cerebrospinal fluid pressure* is increased in patients with congestive failure, and usually is parallel, in the prone position, to the venous pressure. This pressure falls with the venous pressure as compensation returns. Spinal drainage in the majority of patients was followed by a diminution in the dyspnœa if the change in the venous pressure was variable. There is a discussion on the relation of these points to dyspnœa and orthopnœa in cardiac failure.

Heart Disease in Pregnancy.—A. E. Lamb,⁷ in an article on heart disease in pregnancy, includes a review of 2193 cases of pregnant women with cardiac disease seen during a period of four years. He finds that one-third of the cases of mitral stenosis suffered from decompensation, but no cases of uncomplicated mitral insufficiency. Also it was noticed that in most of the cases that underwent decompensation it was before the onset of labour, and no relation could be ascertained between this onset and the month of pregnancy. Ninety per cent of cases were rheumatic in origin, and the most frequent lesion was mitral stenosis with or without insufficiency.

A. R. Gilchrist and R. M. Murray-Lyon,⁸ in an investigation of 109 cases of fatal cardiac rheumatism with mitral stenosis, attempt to assess the danger of child-bearing in reference to this disease. They find that taking the adult cases, whereas the average age at death for males is 34.8, that for nulliparæ is 39.5 compared with 42.0 for parous women. In those in whom auricular fibrillation

appears the death-rates were 39.6 in males, 44.1 in nulliparæ, and 45.8 in the parous, so that the presence of auricular fibrillation in women does not appear to affect the outlook adversely. Their conclusions on the question of child-bearing are that one or two children may be born without detriment by the majority of women with this form of disease; repeated pregnancies, however, tend to shorten the spell of life.

F. B. Carr, B. E. Hamilton, and R. S. Palmer⁹ found a large Q3 wave in 17 out of 342 pregnant women, 98 of which had organic heart disease. They conclude that a large Q3 is frequently associated with an inverted T3 or an inverted P3. In patients with normal hearts in which a large Q3 is present it is probably associated with the more transverse position of the heart in pregnancy, and is not therefore a reliable sign of disease.

Radiology in Heart Disease.—J. Parkinson,¹⁰ in the combined sections of Medicine and Radiology at the Annual Meeting of the British Medical Association, discusses the value of radiology in heart disease. It is more accurate and informing than percussion, which it replaces when available, and it is essential in a complete examination of cardiac disease. The results that it gives confirm physical diagnosis and extend it. Moreover, it aids prognosis in that the size of the heart is an important matter in this respect. Radioscopy should include an antero-posterior view and a right and left oblique view. The two oblique pictures may be visualized better if barium is swallowed. Enlargement of the heart should not be diagnosed on radiology alone; some other clinical feature should be present as well. An apparent enlargement may be due to scoliosis. It is specially desirable to concentrate on the outline of particular chambers. The author warns those dealing with X rays in cardiac patients not to distress them by undue emphasis on additional abnormal points which may be discovered and which may only be confirmatory of what is already known. (*See also X-RAY DIAGNOSIS—THORAX.*)

TREATMENT.

Sir Maurice Cassidy,¹¹ in a British Medical Association Lecture, makes some very practical remarks on the treatment of 'cardiac cases'. He mentions the schoolboy's heart seen in a rapidly growing boy, sometimes the son of over-anxious parents, who complains of palpitation, possibly of apical pains, and who confesses to being more easily rendered breathless than other boys. The apex beat is perhaps forcible and diffuse, possibly a little outside the nipple line. The rate may be rapid and may be accelerated unduly on effort or emotion. A systolic murmur is often present. In these cases it is important not to attach a cardiac label to such a boy unless the evidence of cardiac disease is beyond question, but there is, of course, no option if there is a recent history of rheumatism, clear evidence of valvular disease, or obvious enlargement of the heart. X-ray examination is of great assistance in determining accurately the size and shape of the heart. In the absence of clear evidence of disease Cassidy allows games under the supervision of the school doctor, forbidding for the time being races and strenuous exertion such as rope climbing. In speaking of the cardiac neuroses which form such a large proportion of the cases sent to a cardiologist, he sums up the treatment in a single word, *reassurance*, and this must be emphatic, without reservation. He says that it is no use telling the patient that the heart is a little flabby or that there is a slight murmur of no great importance, for to the lay mind anything amiss with the heart conjures up serious possibilities. It may be necessary to confirm the clinical estimate with an electrocardiogram, or an X-ray investigation, but the conviction in the mind of the doctor must be clear that there is or is not something wrong with the heart, and when the latter, it must be conveyed in strong terms to the patient.

It may be necessary in a case of cardiac invalidism to remove restrictions gradually and help the patient to a return to a more normal life by massage and graduated exercises. Digitalis is contra-indicated as it does no good and may cause the patient to persist in his notion that there is cardiac abnormality. In some cases the doctor runs a risk in giving such advice, especially in those nervous patients whose history may suggest angina pectoris. Nevertheless, even in these patients a reassurance is often beneficial in that it may remove that functional element which is engrafted on to many of the organic cardiovascular diseases. When a patient with valvular disease is able to carry on the ordinary routine of his life without undue dyspnoea, if he sleeps well, and if there is no evidence of early congestive failure, he can be assured that his valvular lesion is not a serious disability, and that it is compatible with many years of average health.

C. Lian and Deparis¹² find that the phasic variations which simulate Cheyne-Stokes respiration in sleep are abolished by *carbon dioxide* and are unaffected by oxygen. The same effect has been noticed in patients who show the Cheyne-Stokes respiration as a result of cardiac or arterial disease. They use a mixture of 5 per cent to 10 per cent of CO_2 in ordinary air.

Guggenheimer¹³ recommends *euphyllin* for Cheyne-Stokes breathing and asthma of cardiovascular origin. It is administered intravenously in doses of 0.48 grm. in 10 c.c. of distilled water or 20 per cent glucose solution. When cardiac failure is present it is advantageous to add 0.25 mgrm. of strophanthin to the dose. The action of euphyllin is to produce dilatation of the coronary arteries and of those supplying the respiratory centre. There is no evidence that euphyllin has any action on bronchospasm which may also be present in these cases.

Two papers by A. R. Gilchrist¹⁴ deal with the action of *atropine* and *adrenalin* respectively in complete heart-block. Repeated electrocardiograms after the injection of $\frac{3}{10}$ gr. of atropine sulphate in 10 patients showed that the prevailing view—namely, that it has little or no effect on the frequency of the ventricles—needs modification. Atropine increased the rate of the ventricles in varying degree. The initial ventricular rate is the important factor in determining the amount of acceleration for a given dose. The higher the rate, the greater the response. The use of atropine as a means of distinguishing complete heart-block is therefore unreliable. It is suggested that these variations are dependent on the position of the lesion in the conducting tract, and that when situated in the upper part a greater response will occur than when situated in the lower. Twelve cases of complete heart-block were tested with adrenalin chloride, and it was found that the optimum response occurred with 0.5 c.c. High initial rates are followed by little or no gain in rate, slow rates by pronounced acceleration. This implies that the response of the heart is determined not by the amount of the dose but by the rate of the heart existing at the time of the injection, and it was found that for a given initial rate 0.25 c.c. of adrenalin would produce as much acceleration as a dose four times that amount.

Adrenalin for the relief of Stokes-Adams attacks is not always successful. It should, however, be given a trial when seizures happen frequently. The difficulty of distinguishing between those that react favourably and those that react unfavourably has led A. R. Gilchrist¹⁵ to attempt the same effect with *ephedrine sulphate*. In 4 out of 6 patients this drug had the effect of increasing the number of ventricular beats. In 2 cases of complete heart-block with Stokes-Adams seizures ephedrine was successful in preventing syncope attacks over a period of two and a half and one and a half years respectively in each case. The dose of ephedrine should be the minimum amount that causes an acceleration of the resting ventricular rate, and an average dose is $\frac{1}{2}$ gr. every eight hours by the mouth.

A. R. Gilchrist¹⁶ finds that in two of the subjects investigated *amyl nitrite* caused a remarkable increase in the ventricular rate in heart-block, the increase in the auricular rate being much less. It cannot, therefore, be used as an indication of complete and incomplete heart-block, for in the two cases mentioned in which the increase was marked the evidence of permanent block continued.

Büdingen¹⁷ was unable to find any evidence that the treatment of cardiac failure by giving *glucose and insulin* was of benefit. Indeed, the condition of some of the patients became worse. The method was to give 30 to 50 gm. of glucose orally or intravenously in the morning followed by a subcutaneous dose of 10 units of insulin.

I. M. Dixon¹⁸ reports from medical literature a number of cases in which *salyrgan* has been used continuously for cardiac oedema, and she reports one case of her own. The conclusion is that *salyrgan* can be used without interruption and without the risk of any toxic effects. One case is reported in which a total of 270 injections were given during a period of five years. A dose of 2 c.c. of the 10 per cent solution is given every few days, and the effect appears to be beneficial not only in the relief of oedema but in staving off the symptoms of early cardiac insufficiency.

I. Starr, jun.,¹⁹ reports a beneficial action of *acetyl-β-methylcholin* in arresting attacks of paroxysmal tachycardia. It is obtainable in ampoules containing from 0.02 to 0.2 gm. The amount injected by Starr has varied from 0.005 to 0.05 gm. *Acetyl-β-methylcholin* has a powerful vasodilator effect and has been used in Raynaud's disease. On subcutaneous injection it is followed by marked flushing, sweating, and sometimes by salivation, a fall in blood-pressure, and a rise of pulse-rate. This stage lasts only two to three minutes, and all the symptoms pass off within twenty minutes. When taken by the mouth the action is mild and no uncomfortable or alarming symptoms were produced, though a gradual fall in blood-pressure and a rise in pulse-rate were usually seen. Its pharmacological action is similar to that which follows stimulation of the vagus. Twenty-nine attacks of paroxysmal tachycardia in nine patients have been treated by injections of this drug, in most instances after attempts had been made to stop the attack by pressure on the carotid arteries. Its action in these cases is to cause flushing of the face and neck in about a minute. A few seconds later a brief cardiac pause is observed followed by a momentary period of irregularity both of rhythm and force. The blood-pressure is diminished from 10 to 20 mm. and the pulse becomes weaker, breathing is increased, and salivation also occurs. It is followed by normal rhythm. The vascular spasm of Raynaud's disease when excited by mild degrees of cold was relieved or prevented by the action of the drug taken by the mouth. Severe spasm following exposure to cold was little affected; but in three patients the drug caused an amelioration of discomfort and pain when taken by the mouth. In certain cases of thrombo-angiitis obliterans it caused a rise in surface temperature, and in cases of threatened gangrene from obstructive peripheral disease it relieved pain. In cases of headache with hyperpiesis the results were unsatisfactory.

REFERENCES.—¹*Brit. Med. Jour.* 1934, i, Feb. 17, 278; ²*Arch. of Internal Med.* 1933, lii, Dec., 991; ³*Amer. Jour. Med. Sci.* 1933, clxxxvi, Dec., 833; ⁴*Glasgow Med. Jour.* 1934, March, 65; ⁵*Calif. and Western Med.* 1933, xxxix, July, 17; ⁶*Arch. of Internal Med.* 1934, liii, May, 782; ⁷*Amer. Jour. Med. Sci.* 1934, clxxxvii, Feb., 177; ⁸*Edin. Med. Jour.* 1933, xl, 587; ⁹*Jour. Amer. Med. Assoc.* 1933, ci, Aug. 19, 633; ¹⁰*Brit. Med. Jour.* 1933, ii, 591; ¹¹*Ibid.* 1934, Jan. 13, 45; ¹²*Bull. Soc. Hôp. de Paris.* 1933, Dec. 8; ¹³*Zeits. f. Kreislaufforsch.* 1933, xxv, 98 (abstr. in *Amer. Jour. Med. Sci.* 1933, Sept., 446); ¹⁴*Quart. Jour. Med.* 1933, n.s. ii, Oct., 483, 489; ¹⁵*Brit. Med. Jour.* 1934, i, April 7, 610; ¹⁶*Jour. Pharmacol. and Exper. Therap.* 1934, i, March, 286; ¹⁷*Amer. Jour. Med. Sci.* 1932, clxxxiv, Aug., 298; ¹⁸*New Eng. Jour. Med.* 1934, cex, April 12, 800; ¹⁹*Amer. Jour. Med. Sci.* 1933, clxxxvi, Sept., 330.

HEART DISEASE, CONGENITAL. (*See* PATENT INTERVENTRICULAR SEPTUM.)**HEART FAILURE, THYROIDECTOMY IN.** (*See also* THYROID AND PARATHYROID SURGERY.) *A. G. Gibson, M.D., F.R.C.P.*

Several important papers deal with the effect of thyroidectomy as a method of treatment in congestive heart failure and angina pectoris. H. L. Blumgart, J. E. F. Riseman, D. Davis, and D. D. Berlin¹ say that the method was suggested from the accurate estimation of the velocity of blood through the lungs (*see* BLOOD VELOCITY). This velocity in normal subjects varies with the metabolic rate of the body. In hyperthyroidism the speed is increased, in myxœdema it is lowered. In subjects with congestive heart failure, though the metabolic rate may be normal the blood velocity was found to be slow. This lack of correspondence offered an explanation of the symptoms and signs in decompensation, and suggested the method of lowering the basal metabolic rate by thyroidectomy. Subtotal thyroidectomy in the first cases under Blumgart, Levine, and Berlin was reported in last year's MEDICAL ANNUAL (p. 224). Further reports show that it produced temporary improvement only, and it was then realized that complete extirpation of the thyroid was necessary before the metabolic rate was sufficiently lowered to slow down the blood velocity so that an equilibrium could be established in the circulation. The rationale of the treatment of cardiac disease apart from thyrotoxicosis, therefore, is to relieve the patient of the necessity for a rapid circulatory rate by lowering his metabolism to the condition of that of a myxœdematous patient. The same arguments are applicable to angina pectoris. The higher the metabolic rate, the greater is the cardiac output and the necessity for a large coronary supply. No patient was submitted to this procedure in whom the prognosis for life was good.

The operation was offered to the patient without minimizing the risks. Most of them willingly accepted it because no benefit had been secured perhaps for many years by other treatment. The patients included several different types of cardiovascular disease, arteriosclerotic with cardiac failure or with angina pectoris, and with hypertension. Some had right ventricular failure and others failure from rheumatic disease with or without fibrillation. Total ablation of the thyroid gland was done under gas and oxygen anaesthesia and most of the glands on examination were proved to be normal. The effect of this total ablation in two patients with angina pectoris was marked. In one patient who had had increasingly frequent attacks over a period of eighteen months the operation allowed him to do six times the amount of work that he had been able to perform before. Another patient was able to walk about with greater freedom, ceased to suffer from dyspnoea, and subsequently had no cardiac pain. Seven out of 9 patients with congestive failure were able to be up and about without the symptoms and signs that had been there before. Total ablation produced lowering of the basal metabolic rate and the velocity of blood-flow through the lungs, but the blood-pressure remained unaltered. In the electrocardiogram in some cases there was a decrease in the voltage of the QRS complex, and in about one-third a flattening of the T waves in one or more leads. The vital capacity of the lungs increased. In one case hæmoptysis, which had been very frequent for seven years, became much less frequent. Paroxysmal dyspnoea was not affected by thyroidectomy except in a minority.

The patients expressed themselves as feeling calmer and less nervous. The heart-rate as well as the respiratory rate was lower. The temperature was not altered. There was no mental lethargy, no alteration was found in the

size of the heart, and no parathyroid tetany encountered, though in two patients Chvostek's and Trousseau's signs became evident after the operation. There was one operative fatality from bronchopneumonia. Including the patients previously reported by these authors the operative mortality is 2 in 16 (12.5 per cent). It is emphasized that after subtotal extirpation the benefit is temporary. Occasional signs of mild hypothyroidism have developed, such as a yellowish tinge to the skin and a diminished necessity for shaving in the male patients.

S. A. Levine, E. C. Cutler, and E. C. Eppinger² report a series of 12 cases, some of which have been already alluded to in their previous writings. They refer to the fact that heart disease resulting from hyperthyroidism is the one cardiac ailment that is benefited by active treatment, and they make the statement that cardiac insufficiency and angina pectoris may be alleviated if not cured by removal of the thyroid even when the basal metabolism has not previously been raised. A patient previously bedridden with hypertensive heart disease or with mitral stenosis and hyperthyroidism may be restored to full activity following the removal of a toxic thyroid gland. They refer particularly to cases of thyrotoxicosis with cardiac symptoms yet without any raised basal metabolic rate. The effect of thyroidectomy is in the thyrotoxic cases to put the heart at rest, for the added burden of the rapid pulse is removed. The cases here reported are those in which the thyroid gland to clinical and pathological examination has been normal. The effect has been to remove completely general anasarca with orthopnoea and to restore a considerable measure of health. Their first patient operated on by a subtotal thyroidectomy had perfect health for two years, but then there was a return of cardiac failure from which she died. Another case, a man aged 53, with the angina of effort, had a subtotal thyroidectomy which lowered the metabolic rate from 24 to 10. The anginal pains, though present, were much less and his power of exercise was considerably greater. Another patient is reported to have obtained complete relief from anginal attacks. This patient developed myxœdema which responded well to thyroid medication. These authors also have come to the conclusion that a total thyroidectomy is the operation to be aimed at. The cases selected are those suffering from hopeless and incurable heart disease in whom the surgical risk is not overwhelming. The operations are done under local anaesthesia and appear to be followed by no serious or untoward effects. There was only one post-operative death, but the operation was performed as a last resort and the patient was almost moribund at the time.

O. Brenner, H. Donovan, and B. L. S. Murtagh³ report the effects of total thyroidectomy in those patients without hyperthyroidism and with incapacitating congestive failure or angina pectoris or both in which all previous treatment had been ineffectual. The only death recorded was in one patient who died of cerebral hemorrhage six weeks after the operation. All the patients showed some improvement and were capable of more exertion. One of them, a woman who had been incapacitated for six months, was able to do her housework except for heavy washing. In two cases alone a slight degree of hypothyroidism appeared.

A. A. Weinstein, D. Davis, D. D. Berlin, and H. L. Blumgart,⁴ writing on the mechanism of the early relief of pain in patients with angina pectoris after total thyroidectomy, state that this relief is due to the interruption of afferent nerve impulses over the heart at the time of the operation. This relief is only temporary, and any permanent relief of symptoms is the result of lessened work of the heart following hypothyroidism.

H. F. Friedman and H. L. Blumgart⁵ have found that X-ray irradiation of the thyroid gland used alone or as an adjunct to subtotal thyroidectomy was not

followed by appreciable persistent lowering of the basal metabolic rate in chronic cardiac disease. Their conclusions are, therefore, that in the relief of cardiac failure by this method operative removal of the whole gland is the best procedure.

REFERENCES.—¹*Arch. of Internal Med.*, 1933, lii, Aug., 165; ²*New Eng. Jour. Med.* 1933, cxcix, Oct. 5, 667; ³*Brit. Med. Jour.* 1934, ii, Oct. 6, 624; ⁴*Amer. Jour. Med. Sci.* 1934, clxxxvii, June, 753; ⁵*Jour. Amer. Med. Assoc.* 1934, cii, Jan. 6, 16.

HEART IN MYXŒDEMA.

A. G. Gibson, M.D., F.R.C.P.

W. R. Ohler and Julius Abramson¹ have studied the cardiovascular condition in 35 cases of myxœdema. Less than half of these cases showed abnormal changes in the electrocardiogram—namely, a decrease in voltage and an inversion of the T wave in all leads. Occasionally there is some delay in conduction. Abnormal electrocardiograms are seen with few exceptions when the metabolic rate is minus 25 or lower. Occasionally the X rays reveal enlargement of the heart shadow which returns to normal under the action of thyroid extract. There is a good review of the literature.

REFERENCE.—¹*Arch. of Internal Med.* 1934, liii, Feb., 165.

HEART IN TOXIC POLYNEURITIS.

A. G. Gibson, M.D., F.R.C.P.

G. B. Boyd Campbell and R. S. Allison¹ refer to a group of cases of toxic polyneuritis of which they record eight in which there were marked cardiac symptoms and a tendency to œdema. The T wave in the electrocardiogram was inverted and as the patients recovered returned to normal. The onset of the illness was indefinite, with pains in the limbs, palpitation, shortness of breath on exertion, and swelling of the feet and legs. There was nothing to suggest diphtheria, and swabs of the throat were repeatedly negative. The authors refer to the cardiac symptoms associated with beri-beri. The causal factor was not ascertained.

REFERENCE.—¹*Lancet*, 1933, ii, 410.

HEATSTROKE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Further studies on the composition of the blood and the urine in hot weather, and in a case of heatstroke, have been made in Persia by F. Marsh,¹ who found low sodium chloride concentration in the fasting urine during cold weather in March, a rise in April and June with steady sweating, but a falling off again in July and August, with a shade maximum temperature never below 110° F., when the bodily stocks of sodium chloride are very low at the end of the summer. A case of heatstroke was investigated and the urine found to contain sugar and acetone and to be strongly acid, but it contained no chloride. The patient was treated with insulin, rectal drips of saline, and was given water containing sodium bicarbonate and common salt, with the result that very low urine and blood chlorides rose rapidly, but fell again on omitting chlorides from the diet, only to rise once more with free ingestion of chlorides. The author thinks the lowness of the chlorides encourages free drinking of water, with its rapid excretion and loss of salt in sweating, forming a vicious circle only broken by ingestion of salt. Lactic acid also increases in the blood during hyperpyrexia.

Insulation against heat for the prevention of heatstroke and sunstroke has been studied experimentally by G. P. Crowden,² who has demonstrated that an air-proof material reinforced by aluminium foil on each side, with an air-space of half an inch left on each side of it, greatly decreases the radiation of heat through it to a degree equal to the effect of a one-inch slab of cork. Thus a panel of asbestos cement enabled the heat of boiling water to raise the temperature of a thermometer outside it by 54.5°, but with the addition of the layer

of reinforced aluminium the external thermometer rose only 17° . He successfully tested the practical application of this material in the Egyptian desert for the protection of huts and of tropical helmets, and also for mitigating the heat from the boilers and engines on board ship, and in tents, trains, and ambulances. He also used it for maintaining the heat of food in vessels and in reducing the melting of ice in boxes to one half that which occurred without its help, so his method has wide applications.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hyg.*, 1933, Nov. 30, 255; ²*Lancet*, 1934, Jan. 6, 37.

HERMAPHRODITISM. (See EUNUCHS AND HERMAPHRODITES.)

HERNIA.

A. Rendle Short, M.D., F.R.C.S.

Relation to Injury.—J. J. Moorhead¹ returns to the oft-discussed problem of the relation of hernia to injury, and concludes that a single trauma cannot cause a hernia to descend without an actual tear, but of course any injury that increases intra-abdominal pressure may aggravate a hernia. A new acute hernia always gives rise to pain, nausea, and tenderness; at operation, hæmorrhage or œdema will be present.

Operative Technique.—C. M. Smyth,² of Philadelphia, produces figures to show that the Bassini operation allows some 7 per cent of recurrences, and that not only in patients who were unpromising from the start. Its weaknesses are that it makes no attempt to strengthen the internal ring by utilizing the transversalis fascia; the external oblique aponeurosis is merely restored to the *status quo ante*, and one cannot rely on muscle and ligament uniting. He uses the Edmund Andrews 'white fascia' operation; after tying off the sac, the transversalis fascia is sewn to Poupart's ligament from the internal ring to the spine of the pubis, disregarding the conjoint tendon. The mesial leaf of the external oblique aponeurosis is then sutured to Poupart's ligament below the cord. Andrews then roofs it over with the lateral or lower flap of aponeurosis; Smyth sews it to the mesial flap below the cord. Placing the cord immediately beneath the skin does not produce any unpleasant symptoms.

Recurrence Rate.—According to W. Black,³ of Berlin, who investigated the end-results of 20,199 operations for inguinal hernia, of 4177 Bassini cases followed up, 4.2 per cent recurred. The other figures are much smaller in number, but the percentage of recurrence is about the same. W. Schür,⁴ of Basel, gives very similar figures for the Bassini operation.

Direct Hernia.—E. Andrews and A. Bissell,⁵ of Chicago, maintain that direct hernia is in most cases a harmless condition, carrying little, if any, risk of strangulation and not likely to increase greatly in size; the results of surgery are appallingly bad, the recurrence rate in 1545 cases being 20 per cent. It is better to let them alone. The only type which ought to be operated on is that in which there is a diverticulum of the dome-shaped sac, and this is usually diagnosed before operation as an oblique hernia. [The authors admit, and other observations establish, that much better results can be got if fascial grafts after the Gallie pattern are used.—A. R. S.]

Femoral Hernia.—R. Rutherford⁶ has a technique for femoral hernia; a strip of pectineus muscle is turned up, and threaded through the rectus abdominis in front of Poupart's ligament to form a pad in the path of the hernia.

Umbilical Hernia.—It is, or ought to be, well known that this condition is much more dangerous than a groin hernia; strangulation is common, and carries a mortality rate of about 30 per cent. Of 289 non-strangulated cases operated on, the death-rate was only 2.5 per cent (R. H. Miller and M. K. Bartlett.⁷)

PLATE XXVI
CONGENITAL DIAPHRAGMATIC HERNIA
(M. R. BARRETT AND C. E. W. WHEATON)



Fig. A.—X-ray photograph taken before operation, showing the left side of the chest to be full of gas shadows, and the heart displaced completely over to the right.



Fig. B.—X-ray photograph after a barium meal. The majority of the intestines are in the thorax, and the orifice is on the left side of the diaphragm.

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Strangulated Hernia.—R. Wood Power⁸ points out that as a rule the patients who die never seem to pick up after the operation, but quickly show evidence of toxæmia, shock, or lung complications. He stresses the value of a local instead of a general anæsthetic.

About 2000 persons die every year in this country from strangulated hernia, as compared with about 2800 from appendicitis. This ought to be regarded as a strong argument for the radical cure of all hernias before disaster overtakes them.

REFERENCES.—¹*New Eng. Jour. Med.* 1933, Sept., 568; ²*Ann. of Surg.* 1934, Feb., 260; ³*Arch. f. klin. Chir.* 1933, Aug., 607; ⁴*Deut. Zeits. f. Chir.*, 1934, April, 96; ⁵*Surg. Gynecol. and Obst.* 1934, April, 753; ⁶*Med. Press and Circ.* 1934, Nov., 411; ⁷*New Eng. Jour. Med.* 1933, Sept., 565; ⁸*Brit. Med. Jour.* 1934, i, 787.

HERNIA, CONGENITAL DIAPHRAGMATIC, IN INFANTS.

John Fraser, Ch.M., F.R.C.S.Ed.

Although congenital diaphragmatic hernia is undoubtedly a rare occurrence, there are records in the literature of more than a thousand cases, and there must be a large number which have not been reported. With present methods of investigation the diagnosis is established with greater frequency and fuller accuracy than hitherto, and it has followed that treatment by operation is being increasingly practised.

The subject is discussed by M. R. Barrett and C. E. W. Wheaton¹ in connection with two cases, one of which was operated on in St. Thomas's Hospital.

According to the classification which was adopted by Hume five varieties of the error are recognized: (1) Hernia through the dome of the diaphragm; (2) Hernia in relation to the œsophageal opening; (3) Complete absence of one or both halves of the diaphragm allowing the peritoneum to communicate with the pleural cavities; (4) Hernia through the pleuro-peritoneal canal on one or other side; (5) Hernia through one of the vascular foramina. The second group in this category is the most common type, but, as it may give rise to few symptoms, and as it rarely demands surgical interference, the occurrence is not important. The cases referred to in this paper were examples of the fourth group—hernia through the pleuro-peritoneal canal. Whatever the type, the symptoms and physical signs have a certain similarity. There is dyspnoea with cyanosis, vomiting, and sometimes loss of consciousness. The cardinal physical signs are displacement of the heart and mediastinum, with evidence of the bowel in the thoracic cavity. By means of X-ray examination a confirmation of the diagnosis is secured (*Plate XXVI*).

In the past, congenital diaphragmatic hernia has been regarded as a hopeless surgical proposition, and treatment has been limited to palliative measures, but we must realize that under such conditions 88 per cent of the cases have succumbed within the first few weeks of life. Surgeons argue that they can show more promising results by operation, and that is the claim which is urged by the authors of the paper under review. Their recommendations are as follows: Favourable cases are—the pleuro-peritoneal types on the left side, hernia through the septum transversum, and small herniæ in relation to the œsophagus. Access should be gained through the abdominal route, as by this means the reduction of the hernial contents is facilitated. Following reduction, steps must be taken to close the diaphragmatic defect, either by approximating the edges or by securing a viscus within the aperture. Thereafter the pneumothorax should be relieved by aspiration of the air which remains within the pleural space. Ether is the anæsthetic of choice.

REFERENCE.—¹*Brit. Jour. Surg.* 1934, Jan., 420.

HODGKIN'S DISEASE. (See BLOOD DISEASES.)

HYDATID CYST OF LIVER. (See LIVER, SURGERY OF.)**HYPERPARATHYROIDISM; HYPERTHYROIDISM.** (See PARATHYROID; THYROID.)**HYPERTENSION.**

A. G. Gibson, M.D., F.R.C.P.

ETIOLOGY.—Sir Humphry Rolleston, in introducing a discussion on *essential vascular hypertension* in the Section of Medicine at the Annual Meeting of the British Medical Association in 1933, gave a brief historical introduction, and followed with a short discussion of the physiological aspects. The most interesting part deals with etiology. Hypertension precedes and may be responsible for arteriosclerosis and chronic renal sclerosis. A persistently raised blood-pressure is a reaction to one of many factors. It has been asserted that vascular hypertension is a constitutional disease with dominant Mendelian characteristics, and the absence of hyperpiesis in pure-bred Chinese is mentioned. Many interesting facts are put forward bearing on the relation to endocrine disorders. A search for pressor bodies, especially for adrenalin, in the blood of patients with hyperpiesis has been disappointing, though primary adrenal tumours have in some instances been associated with it. The neuroblastomas of the adrenal medulla are not associated with a raised blood-pressure, whereas those of the chromaffin cells and the cortex occasionally are. Thirty cases were collected by Rabin in 1929. In these tumours adrenalin has been found, and in the crises of hypertension to which these patients are subject it is supposed that an excessive amount of adrenalin is discharged into the blood. The blood-pressure may rise to 300 mgrm. of Hg in response to emotions such as fear. These attacks have been regarded as similar to Nothnagel's angina pectoris vasomotoria and to the characteristic symptoms which follow the intravenous injection of adrenalin. The crises disappear on the removal of the tumour. The hypertension that occurs at the time of the menopause in women and associated with arthritis has been ascribed to endocrine effects. It is very doubtful to what extent psychical influences may be a cause of the disorder. It is known to be prevalent amongst people who react quickly and violently to external circumstances, and it was pointed out as early as 1876 by Clifford Allbutt that it is associated with mental anxiety. Statistical investigations, however, do not point to the greater prevalence of hyperpiesis amongst those who are subject to mental strain. Polycythæmia is often found in patients with hyperpiesis, but is not a causal factor, as a considerable degree of polycythæmia may be found without increased blood-pressure.

W. W. D. Thomson² gives an interesting account of the *renal aspects of essential vascular hypertension*. This disease is associated with a hyaline thickening of the subendothelial layer of the intima of the arterioles in many organs of the body, and when it affects the kidneys it leads to atrophy of the glomerular tuft. Only when this atrophy becomes extensive is the renal function interfered with. There is therefore a period, sometimes of many years, in which there is no clinical evidence of disease of the kidneys. This has been termed the albumin-free stage. Later on the albuminuria is inconstant, often slight and intermittent. In this stage there are a small number of casts and white and red blood-corpuscles in the centrifugalized deposit.

It is important to differentiate the albuminuria of hypertension from that of chronic nephritis. Essential hyperpiesia is much more common, carries a more favourable prognosis, and also demands a different type of treatment. Essential hypertension is compatible with several decades of useful life, but chronic nephritis is always dangerous because the march of renal insufficiency is much more progressive. The hyperpietic patient should be kept at work

if suitable conditions can be imposed, whereas the chronic nephritic is better if he leads a very protected and invalid life. A useful table is set out with the differences between these two types. The organs that are most liable to suffer in essential vascular hypertension are the heart, brain, and kidney. Cardiac failure, cerebral hæmorrhage, and uræmia are the diseases most commonly met with. Cardiac failure forms the commonest form of death, 32 to 60 per cent according to different authors; cerebral hæmorrhage 19 to 31 per cent; and renal failure below 10 per cent. An interesting clinical history is set out of a patient observed for six years in whom there were several hæmorrhages—from the bowel, from the lungs, and from the kidneys. Though hæmorrhage is so common in the brain it is sometimes forgotten that this event in the other organs may be associated with hyperpiesis. Thomson deals with the question of the differentiation of these stages by renal tests, and recommends that of Calvert as the simplest, requiring only an estimate of the specific gravity of the urine in two specimens. The patient takes no fluid after 5 p.m., and at 11 p.m. empties the bladder completely. At 7 a.m. the bladder is emptied and the specimen kept. A large quantity of fluid is then taken, say two breakfast-cups full of weak tea without sugar, and two glasses of water. After two hours the bladder is again emptied. The first specimen should have a high specific gravity, 1025 or upwards, the second specimen should have a low specific gravity of about 1005.

In regard to the *effect of personality on essential hypertension* D. Ayman³ remarks that it is important to attempt to modify this so-called hypertensive personality, and to lessen the emotional and psychical responses of the patient because they are accompanied by marked elevations in blood-pressure. He uses to this end both education and sedatives. In a study of 182 subjects of essential hypertension he finds an increase in psychomotor activity. They are dynamic and hyperactive persons with a large and steady output of energy. They are sensitive and quick-tempered and that would appear to be an inborn feature.

Malignant hypertension is such a distressing ailment that almost any measures that offer relief should be considered. A. W. Adson and G. E. Brown⁴ review the surgical measures that have been tried, and give a report of a case in which the blockage of the sympathetic impulses was attempted by surgical means. Rowntree, in 1925, did a bilateral sympathetic ganglionectomy on a patient in whom the ultimate outcome was not beneficial. The present authors' patient was subjected to bilateral section of the anterior and posterior roots from the sixth thoracic to the second lumbar inclusive. This was suggested because of the observation that the blood-pressure drops and vasopressor reactions are inhibited following spinal anaesthesia. In this case the blood-pressure dropped at the end of the operation to 100 mm. max., and at the end of the month the maximum varied from 140 to 160 systolic and from 80 to 110 diastolic. The headaches and the crises of paroxysmal hypertension disappeared, and this persisted up to the last observation one year later. The patient, a woman of 29 with a blood-pressure of 228/156, had frequent headaches, marked fatigue, palpitation, and dyspnoea. The kidneys showed no evidence of disease. At the operation under ether anaesthesia a section was made of the anterior nerve-roots from the 6th thoracic to the 2nd lumbar inclusive. Following the operation, which was uneventful, the patient had no disturbance of micturition, and motor power and sensation of the extremities remained normal. The muscles of the abdomen, however, were relaxed. The result was to cause a permanent lowering of the maximum and minimum blood-pressure, though not to normal limits, and the general effect was good.

REFERENCES.—¹*Brit. Med. Jour.* 1933, ii, Aug. 5, 233; ²*Ibid.* Nov. 18, 910; ³*Amer. Jour. Med. Sci.* 1933, clxxxvi, Aug., 213; ⁴*Jour. Amer. Med. Assoc.* 1934, ci, April, 70.

HYPNOTICS. (*See also POISONING.*) *Ivor J. Davies, M.D., F.R.C.P.*

Uses and Dangers of Hypnotic Drugs other than Alkaloids.—Sir William Willcox^{1, 2} opened a discussion at the Royal Society of Medicine on this topic. This opening paper should be very carefully read, as there is a real danger in the injudicious use of these drugs. A classification on chemical and clinical lines was submitted. A selection of the more important hypnotic drugs is reproduced from Willcox's groups, followed by an abstract of the opinions of others who participated in the discussion.

ALCOHOL-CHLORAL GROUP.—There are many hypnotic drugs of this class which are rarely used because of uncertain and sometimes dangerous effects.

Chloral has undeservedly fallen into disuse, but if used continuously it may have deleterious effects, and may give rise to addiction.

Paraldehyde is a useful and safe hypnotic for occasional use, but if repeated may cause toxic liver effect and give rise to addiction.

Avertin is tri-brom-ethyl alcohol. It has been used extensively as a basal anæsthetic and is administered rectally. Care and experience are required to decide on the suitable dosage, and harmful effects may ensue in susceptible subjects.

THE UREA GROUP.—Urethane, uradal or adalin, bromural or dormigene, and somnosal are all safe and mild hypnotics. Urethane is suitable for children.

SULPHONE GROUP.—Sulphonal, trional, and tetronal are powerful hypnotics, much less used than formerly owing to slow absorption and slow action.

BARBITURIC ACID GROUP.—Barbitone (veronal) and its sodium salt (medinal), luminal, allonal, dial, and many other preparations containing barbituric acid derivatives are sold, and are the most commonly used hypnotics at the present time. The toxicity of the derivative increases with the substitution of larger radicles than ethyl; thus it is probably safer to use barbitone or medinal than the more complex derivatives. Idiosyncrasy, and several acquired contra-indications, such as defective renal function, myocardial disease, etc., must be borne in mind.

BASAL ANÆSTHESIA.—The need for care in dosage with the drugs used for this purpose cannot be too strongly emphasized. A therapeutic dose may be an overdose in a susceptible person, and as absorption is rapid, one has to combat the full effect of the toxic symptoms.

Willcox concluded an authoritative opening of the discussion by some general recommendations, the more important being: In prescribing hypnotics, it is best to select one, or a combination, of the less toxic types of drugs whose action is well known. He never prescribes any of the barbituric acid group of drugs or of the sulphonal group. There is urgent need for control of the prescription of hypnotic drugs with toxic properties. The total quantity ordered on a prescription should be well under a possible fatal dose, and the prescription should be retained by the pharmacist and only repeated by medical authority and signature.

Dr. F. L. Golla made a physiological analysis of the nervous mechanism involved in the production of sleep. The dangers inherent in the depressant action of powerful hypnotics were explained.

Professor J. A. Gunn showed that to treat every case of insomnia by the administration of a hypnotic is just as irrational as to treat every case of cough by administration of morphine. He deprecated the prescription of tablets as they are too easily obtained and in too large a quantity.

P. K. McCowan has found *sulphonal* particularly useful in acute exacerbations of excitement in chronic psychosis; from 20 to 30 gr. three times a day for three days will frequently succeed in cutting short such acute attacks. He never uses it for longer periods than a week.

G. W. B. James considered that in practice hypnotics were often withheld too long. It was important not to let a patient acquire what Sir William Willcox referred to as the "obsession of insomnia". The main danger lay in indiscriminate experimental prescribing, as he had often observed.

Professor Alfred Meyer stated that the work done up to the present on the anatomical changes in the brain produced by hypnotics gives no unequivocal answer to the question of their pathogenesis.

Desmond Curran with Louis Minski conducted an investigation on the value of *nembutal* for the patients they had under them at the Maudsley Hospital, and concluded that *nembutal* in 3 to 6 gr. is a hypnotic of the greatest value, not unpleasant to take, reasonably certain in its action, devoid of risk, and free from unpleasant after-effects.

Sir James Purves-Stewart supported Willcox's remarks on the occasional toxic effects of *barbituric compounds* in ordinary doses.

R. D. Gillespie discussed the belief that therapeutic doses of the barbiturates are or can be dangerous. He compiled a list and tabulated all the papers reporting fatalities in the literature up to the end of 1932. The vast majority are from doses taken with suicidal intent.

Maurice Craig said that when properly given the barbituric acid group were the most valuable of all sedatives, and by taking them, even for long periods when necessary, many men retained their mental activity very late in life.

R. D. Gillespie³ (London), writing on the alleged dangers of the barbiturates, extends the communication made to the Royal Society of Medicine. A careful search of the entire literature was made and the fatalities were tabulated. He concludes that up to the end of 1932 there is no case on record in which barbiturates, either a single dose or repeated doses of therapeutic magnitude, have caused death in the absence of complicating factors. The contra-indications, or indications at least for special caution, in the use of barbiturates are described.

Sir James Purves-Stewart and Sir William Willcox⁴ (London) record cases to illustrate the occasional toxic effects of barbitone compounds on the central nervous system, even in ordinary hypnotic doses, and cases of acute barbitone coma successfully treated by cisternal drainage, supplementary to other measures. The most urgent indication is to hasten the removal of the drug from the central nervous system and especially from the vital medullary centres, which are continually bathed by the poison in high concentration. Cisternal drainage appears to have been life-saving in their recorded cases, in one of which 475 gr. of barbiturate had been taken.

C. P. Wagner⁵ (Hartford, Conn.) writes on the *pharmacological action of the barbiturates*. He states that the barbiturates can be used with advantage in many neuropsychiatric conditions if the physician always bears in mind the various dangers that may be encountered. The following conclusions are drawn from his paper:—

1. Though usually employed for their sedative action, the barbiturates influence almost every system of the body, and their various side actions should be considered in relation to the general condition of the patient.

2. The longer-acting drugs are eliminated slowly and the cumulative effect of long-continued usage may lead to a delirious reaction or to other toxic symptoms.

3. The psychological reactions, which are readily induced by the shorter-acting drugs, usually help in gaining co-operation from the patient, and may aid in interrupting the course of a psychosis and hasten recovery.

4. If the drug is given over a long period, the histological changes produced

by the administration of large doses may lead to permanent impairment of function.

Proprietary Remedies, with Special Reference to Hypnotics.—N. Mutch^o (London) remarks that it would be more in keeping with the dignity and traditions of the profession if independent pharmacological research could be endowed in our medical schools and universities sufficiently well to enable us to make our own discoveries. The physical process of adsorption has become a fundamental therapeutic principle in dealing with intestinal toxæmia and poisoning from contaminated food. A useful descriptive table of the barbituric hypnotics is given, and deserves attention for its account of the proper use of these drugs. The formulæ are simplified and the meaning of substitutions or additions becomes clear. The credentials of every new hypnotic should be carefully examined before a single dose is prescribed. There are many urica derivatives other than the malonylureas, and some are first-class hypnotics. They are not barbiturates, and are particularly useful for patients with idiosyncrasies and for those who have become habituated to barbiturates.

REFERENCES.—¹*Brit. Med. Jour.* 1934, i, March 10, 415; ²*Proc. Roy. Soc. Med.* 1934, xxvii, Feb., 489; ³*Lancet*, 1934, i, 337; ⁴*Ibid.* 1934, i, 6, 500; ⁵*Jour. Amer. Med. Assoc.* 1933, Dec. 2, 1787; ⁶*Brit. Med. Jour.* 1934, i, 319.

HYPOCHROMIC ANÆMIA. (See BLOOD DISEASES.)

HYPOGLYCÆMIA AND HYPERINSULINISM.

Sir Walter Langdon-Brown, M.D., F.R.C.P.

Certain neurological manifestations of hypoglycæmia are discussed by W. R. Jordan.¹ Among the unusual psychic and mental symptoms he mentions two instances in which there was an uncontrollable desire to break things. The reviewer has met with one case in which this frequently followed careless self-administration of insulin. Jordan has also collected a number of cases of temporary paralysis following insulin hypoglycæmia.

G. Graham² gives the following rules for distinguishing insulin coma from diabetic coma:—

In insulin coma: (1) The skin is usually very white, but may be normal in colour; (2) The breath does not smell of acetone; (3) The respirations are shallow; (4) The eyeball tension is normal or raised; (5) The urine is usually sugar-free, but may contain sugar if the bladder has not been emptied for some hours, as it may have been excreted when the blood-sugar was above 200 mgrm. per 100 c.c.; (6) The urine need not contain aceto-acetic acid to Rothera's nitro-prusside test, but may do so if the bladder has not been emptied for some hours; (7) The blood-sugar is below 70 mgrm. per 100 c.c., and may be as low as 40 mgrm. per 100 c.c.

In diabetic coma: (1) The skin is usually flushed; (2) The breath smells of acetone; (3) The respirations are deep (this is shown not only by the movements of the chest, but also of the abdomen, and the latter are most characteristic of the condition); (4) The eyeball tension is much lower than usual; (5) The urine always contains large amounts of sugar; (6) The urine always contains large amounts of aceto-acetic acid; (7) The blood-sugar is over 200 mgrm. per 100 c.c. and may be very high—500 to 800 mgrm. per 100 c.c.

Hyperinsulinism and Epilepsy.—Seale Harris,³ who originally called attention to hyperinsulinism, has raised the question whether epilepsy and narcolepsy are part of this syndrome. He records three cases of the former and one of the latter in which there was oversecretion by the cell-islets of the pancreas, and urges a careful study of blood-sugar curves in such states. If

there be a type of epilepsy associated with or due to hyperinsulinism, there is reason to believe that a low carbohydrate diet, to avoid stimulating the secretion of insulin, combined with a high fat diet, which interferes with the action of insulin, and frequent meals, will maintain the blood-sugar at a level high enough to prevent hypoglycæmic convulsions. A study of the blood-sugar after the use of bromides in one case of epilepsy with hyperinsulinism leads Harris to suggest that bromides control convulsions by inhibiting the secretion of insulin, though he prefers control by diet, possibly combined with ephedrine, belladonna, or phenobarbitol. He raises, therefore, the question of surgical exploration of the pancreas in convulsive states.

P. Pagniez¹ is more cautious. While admitting that in a case reported by Sippe and Bostock, in which a young man with low blood-sugar had epileptiform convulsions after playing tennis strenuously for two hours, there was a causal relationship, he points out that Jacchia and Fattovich have injected insulin up to 28 units into a known epileptic without inducing a paroxysm. and that they have found a normal blood-sugar in a large number of epileptics. He agrees that it is worth while to make blood-sugar estimations in unusual types of epilepsy, but believes that in the great majority of epileptics the attacks develop entirely independently of variations in the blood-sugar level.

REFERENCES.—¹*New Eng. Jour. Med.* 1933, Oct. 12, 715; ²*Med. Press and Circ.* 1934, Symposium No. 1; ³*Jour. Amer. Med. Assoc.* 1933, Feb. 4, 321, Dec. 16, 1958; ⁴*Presse méd.* 1933, May 31, 876.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Hyperinsulinism is a term used to indicate spontaneous hypoglycæmia and is the result of intensive insulinism. When a patient suffering from this condition is hungry he sometimes develops an indescribable feeling of weakness, and in severe cases convulsions and unconsciousness may supervene. Instinctively the patient finds he can be relieved by constantly taking sugary materials. A blood examination will reveal that the blood-sugar is low.

Starr Judd, F. N. Allen, and E. H. Ryneason¹ refer to the surgical treatment of hyperinsulinism and remark that if the patient has severe symptoms, he has been considered drunk; if he has had a convulsion, he has been called an epileptic. His condition is identical with that following an insulin reaction. If he is examined between attacks, nothing abnormal will be found, although patients are sometimes obese as a result of frequent ingestion of carbohydrates. Between attacks the blood-sugar may be normal. It may be best to test the blood late in the morning or afternoon. In such a case W. J. Mayo in 1926 found a carcinoma of the pancreas from which insulin was isolated.

In 29 cases recently reported, tumours were found in 15. Two of these were carcinomata. Judd and his co-workers report the results of operation on 8 patients at the Mayo Clinic. In one case suffering from loss of consciousness and convulsions the pancreas was found normal and a portion of it was removed. The patient improved for a time, but later there was a relapse and he considered his condition worse than it was at the time of operation. In a second case in which the pancreas was removed the patient appeared to improve after taking desiccated thyroid gland.

When operating upon the pancreas the incision should give adequate exposure; a long left rectus incision is the usual procedure at the Mayo Clinic. The pancreas is exposed through the gastrohepatic omentum. In resecting the pancreas the body is grasped with a pair of De Martel intestinal clamps and lifted out of its bed.

Removal of a tumour has usually been accomplished by dissecting it from surrounding tissue. A clamp may be left on the remnant of the pancreas at the termination of operation. Incidentally this serves as a drain in some cases.

Pancreatic fistulæ may drain for a short time, but they usually heal without trouble. As a result of operative treatment it has been noted that after a localized tumour of islet tissue is found and removed the patient will completely recover. When there is no gross change in the pancreas, resection of part of the gland may give temporary relief, but the prognosis is uncertain.

The surgery of the pancreas may be compared to the surgery of the thyroid gland. Finney is quoted as saying "the removal of a large portion of the pancreas is a comparatively safe and simple procedure".

In conclusion the writers say that medical measures frequently fail to give lasting relief; surgical intervention must then be considered. Surgical treatment is indicated when a patient has hypoglycæmia with severe symptoms causing disability. The prospect of cure by operation and the possibility of malignancy influences the decision.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1933, July 8.

INDUSTRIAL DISEASES. (See also POISONING.)

G. E. Oates, M.D., M.R.C.P., D.P.H.

Aniline Cancer.—The so-called 'aniline tumours' of the urinary bladder have been known to occur in German workers in chemical dye factories and dyeing establishments for many years. Ten years ago the condition was almost unknown in England, but with the development of the industry here a number of cases have been reported and nearly 40 deaths have been recorded. The carcinogenetic substances are aromatic bases which circulate in the blood after contact with aniline, benzidine, alpha- and beta-naphthylamine, and their derivatives. These cause tumour formation, almost exclusively in the bladder, and a simple papilloma in the first instance. If it is not removed, the tumour is likely to become malignant. W. C. Hueper¹ furnishes a summary of what is known on this subject. Conforming with observations made on occupational cancers in general, aniline tumours also require a relatively long time of exposure to the carcinogenetic agents before malignancy ensues. Such tumours may not produce any subjective symptoms, but more commonly pain, strangury, and hæmaturia occur before long.

Risks of Sewer Workers.—The air of well-ventilated sewers differs little in chemical composition from that of the ordinary atmosphere. There may be localized spray contamination of the air with sewage bacteria, but sewer men are not found to suffer unduly from enteric fever. In ill-ventilated sewers and sewage tanks there may be dangerous gases, and a Committee appointed by the Minister of Health and the Home Secretary have issued a Report on the matter.² During the fermentation or digestion of sewage solids, the gases evolved are carbon dioxide, hydrogen, sulphuretted hydrogen, and methane. If these gases are permitted to accumulate, the air in the sewer or tank becomes irrespirable from lack of oxygen, and explosive from the presence of methane. Sulphuretted hydrogen is extremely poisonous also. Other gases, such as coal gas or acetylene, may find their way into a sewer and cause poisoning and serious risk of explosion. Certain readily vaporized and inflammable liquids such as petrol are occasionally found in sewers. Of these risks, poisoning is the most serious, and the Committee formulate certain measures for preventing this kind of accident. These include the use of chemical tests and safety and detector lamps. A rescue kit with a breathing apparatus should always be available.

A hitherto undiscovered risk of sewer men has been brought to light by N. H. Fairley.³ The occurrence of a typical and fatal case of Weil's disease in a sewer man led him to make inquiries into the history of other sewer men who had suffered from jaundice in the past, and also to subject their bloods to

specific tests. It appeared that a number of these had undoubtedly suffered from Weil's disease, and that the sewer men of London have been subjected to the ravages of this disease for many years. The risk almost entirely affects labourers engaged in repairing old sewers, the flushers running little risk. During the work of chiselling away and removing the old brick-work the skin of the hands is liable to be injured and the slimy deposit on the lining bricks may be inoculated. This slime is constantly contaminated with the urine of the rats which swarm in the sewers, and since a considerable proportion of London sewer rats are known to be carriers of the causative leptospira of Weil's disease, the method of infection is clear. It appears to be urgently necessary that the author's valuable work should be followed up and measures of prophylaxis undertaken at once.

REFERENCES.—¹*Jour. of Indust. Hyg.* 1934, xvi, Sept., 255; ²*H.M. Stationery Office*, 1934; ³*Brit. Med. Jour.* 1934, July 7, 10.

INFLUENZA.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—K. Juozapavicius¹ states that during the epidemic in Paris in 1933 *asphyxial forms* occurred similar to those seen in the 1918 outbreak. Their development did not appear to be in any way connected with the previous condition of the patients. Two varieties were observed. The first and most frequent was characterized by cyanosis, while the second was associated with facial pallor. In both varieties there was severe constitutional disturbance, profuse sweating, and widespread pulmonary involvement. Examination of the blood showed slight hyperazotæmia and hyperglycæmia with an increase of protein sugar. The prognosis was extremely grave, as in all but one of eight cases seen by the writer death took place within a few hours or in three or four days from the onset. On anatomical examination three groups could be distinguished characterized respectively by acute oedema, congestion of the lung, and acute bronchopneumonia.

C. Gouzonnat² records an outbreak of *influenza among infants* which occurred in the Paris Foundling Hospital in the first quarter of 1932, and was characterized by a predominance of pulmonary oedema accompanied by rhinopharyngitis, bronchopneumonia, and intestinal influenza. The principal features of the outbreak were the sudden onset, the occurrence of paroxysms of dyspnoea with cyanosis, the presence of fine subcrepitant râles at the pulmonary bases without dullness, a relatively profuse frothy sputum, a rapid course with tendency to relapse, and cardiac insufficiency shown by painful enlargement of the liver, oedema of the limbs, and increase in the size of the heart on radiological examination. The autopsy in several cases showed oedema of the lung associated with dilatation of the heart and congestion of the liver.

G. Ruelle³ describes a post-influenzal form of *tracheo-bronchial adenopathy* in children, the chief cause of which is rhinopharyngitis. The diagnosis is based on an absence of an hereditary or personal history of tuberculosis and the rapidity of recovery. The condition is best treated by arsenic followed by residence at the seaside or the use of ultra-violet rays.

L. Mayer⁴ reports 37 cases in patients aged from 7 months to 50 years of *eruptions* complicating influenza: 18 were scarlatiniform, 9 morbilliform, 6 were of the nature of circinate erythema, and 4 were lenticular. The possibility of scarlet fever, measles, rubella, or erythema infectiosum should always be considered in such cases.

A. L. Wolbarst⁵ suggests that influenza may be a possible cause of *sterility* on the following grounds. Stenosis of the vas deferens may occur as the result of infection when the organs at both extremities are apparently normal. Organisms similar to those found in local infections of the prostate, seminal

vesicles, or epididymis can be recarried from the secretion occasionally found in the vas deferens. Influenzal infection of the vas may occur and produce stenosis and permanent sterility unless relieved by vasotomy. In cases of azoospermia without obvious cause an inquiry should be made as to a previous infection with influenza, and if such a history can be obtained, vasotomy should be performed as the only known means of restoring fertility. The stenosis in the vas was removed and motile spermatozoa restored to the semen in 45 per cent of the cases treated by Wolbarst.

J. B. Neal, H. W. Jackson, and E. Appelbaum⁶ record their observations on 111 cases of *influenzal meningitis* with 4 recoveries which they have seen in the last twenty-three years. The symptoms did not differ in any way from those of meningococcal meningitis. More cases occurred in the first year of life than in any other year (34), and more than half the total (62) were in the first two years of life: 59 were in females and 52 in males, contrary to the sex distribution in meningococcal meningitis, poliomyelitis, and epidemic encephalitis. By far the largest number occurred in the last quarter of the year; 68 (61 per cent) were apparently primary infections. Pathological examination showed severe toxic degenerative changes in the liver and kidneys. Bronchopneumonia was fairly common. Endocarditis and acute splenitis were occasionally found, as were also arthritis, peritonitis, and gastritis. There was no particular tendency to the development of adhesions or to the formation of abscesses in the brain. B. B. Rittenberg⁷ records a case of recovery from influenzal meningitis in a girl, aged 8 years, in whom the diagnosis was made on the third day of disease: 15 c.c. of anti-influenzal serum were injected intrathecally every eight hours for forty-eight hours, then every twelve hours for three days, and finally once daily. During the illness 750 c.c. of spinal fluid were removed and 565 c.c. of serum injected. The temperature became normal on the seventeenth day of disease, and when seen six months later the child was in perfect health.

G. Berestad⁸ reports two fatal cases of *B. influenzae septicæmia*. The first was in a female infant, aged 9 months, admitted to hospital with purulent meningitis and arthritis of the left knee, the pus from which showed a bacillus presenting all the characters of *B. influenzae*. The organism was also present in a blood culture. The second case was that of a man, aged 44, who was taken ill with sore throat and œdema of the neck. Bilateral empyema and purulent pericarditis developed, and death took place on the fifth day. The leucocytes at first numbered 13,800, and were subsequently 2800 and 3700. Cultures of the throat, pus, and blood showed a bacillus exactly resembling that found in the first case.

TREATMENT.—G. Petrányi⁹ obtained good results from administration of a 3 or 4 per cent solution of *amidopyrine* in the influenza of infants and young children. The dosage was as follows: from birth to 3 months 0.05 grm., from 3 months to 6 months 0.1 grm., from 6 to 12 months 0.15 grm., and from 2 to 5 years 0.2 grm. The temperature usually began to fall after the third or fourth day and no unpleasant symptoms developed. The drug was continued two-hourly until the temperature reached normal, when the interval between the doses was increased to three hours, then to four hours, and later the drug was given only three times a day. When these larger doses were given to infants they bore their illness much better, lost less weight, and the other symptoms diminished and disappeared.

REFERENCES.—¹*Thèse de Paris*, 1933, No. 380; ²*Ibid.* No. 586; ³*Bruzelles méd.* 1934, xiv, 863; ⁴*Thèse de Paris*, 1934, No. 35; ⁵*Med. Jour. and Rec.* 1933, cxxxviii, 193; ⁶*Jour. Amer. Med. Assoc.* 1934, cii, 513; ⁷*Ibid.* 1679; ⁸*Norsk Mag. f. Læge.* 1934, xcv, 61; ⁹*Amer. Jour. Dis. Child.* 1933, xlii, 1011.

INTESTINAL OBSTRUCTION.

A. Rendle Short, M.D., F.R.C.S.

PATHOLOGY.—Animal experimentation and clinical observation lead R. L. Holt,¹ of Manchester, to conclude that venous strangulation kills, not by toxæmia, but by withholding a large volume of blood from the general circulation; if the loop is too short for this to occur, perforation, or transudation of toxins from the loop to the peritoneal cavity, is the fatal factor. The toxins of *B. welchii* are not responsible. When the arteries are strangulated, death is due to peritonitis and toxæmia. In strangulated hernia (femoral or inguinal), death appears to be due merely to loss of water and chlorides by vomiting.

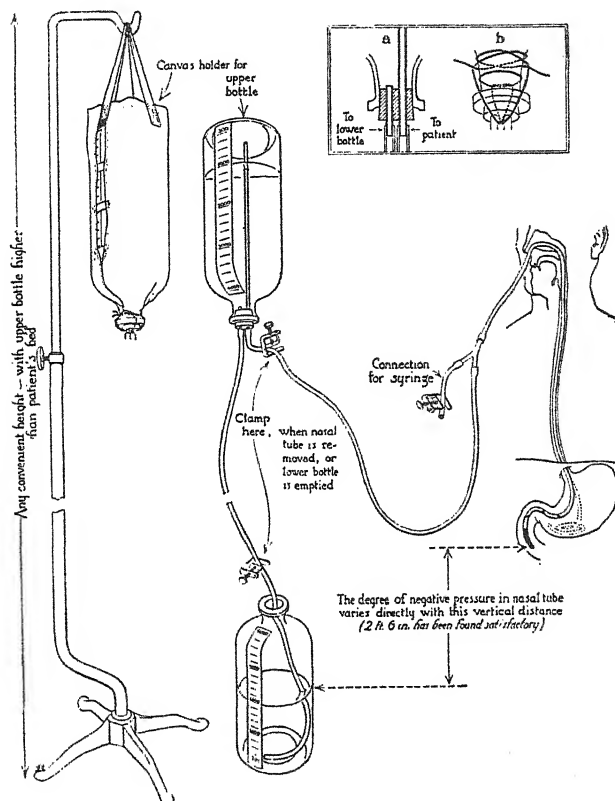


Fig. 22.—Diagram of suction apparatus used at the Minnesota General Hospital. The upper bottle is hung by a canvas sling from an irrigation standard; the lower bottle rests on the floor. A Y connection is attached to the duodenal tube so that a syringe may be conveniently used to clear the tube if it becomes plugged. (Reproduced by kind permission of the 'Journal of the American Medical Association'.)

TREATMENT.—C. B. Schutz,² of Kansas, contributes a really useful paper on the subject of low small-intestine obstruction following laparotomy, mostly for appendicitis or gynaecological operations. There are, he points out, two stages, the obstructive and the 'degenerative'; in the latter the whole of the small intestine is distended and paralysed and the patient is toxæmic; no treatment, under the circumstances, has much chance. The signs of the

obstructive stage are pain, usually colicky, and vomiting; most patients continue to pass flatus per rectum, and they not infrequently have small liquid stools, so that neither of these latter signs is as important as the text-books would lead us to suppose. The best sign of the early obstructive stage is localized, uneven abdominal distension; it needs to be looked for carefully, and is soon lost in a general distension. Schutz points out that to trust to jejunostomy, or to continuous duodenal suction, is to gamble on the chance of the obstruction releasing itself; in his opinion early operation is necessary to release the obstruction before the 'degenerative' stage comes on.

SUMMARY OF MORTALITY OF ACUTE MECHANICAL OBSTRUCTION
OF SMALL INTESTINE (*O. Wangenstein*).

	NUMBER OF CASES	DEATHS	MOR- TALITY	DEATHS UNRELATED TO OBSTRU- TION	CORRECTED MORTALITY
			Per Cent		Per Cent
1. <i>Treatment by suction-siphonage with nasal catheter</i> :—					
<i>a. Decompression by suction alone</i>	20	3	15.0	2	5.0
<i>b. Decompression by suction, but with subsequent operation performed on obstructing mechanism</i>	11	1	9.0	0	9.0
<i>c. Treatment by suction initially, but operation necessary to effect complete decompression</i>	7	3	42.8	0	42.8
Total mortality in groups with suction :—					
Patient mortality	32	7	21.9	2	15.6
Case mortality	38	7	18.4	2	13.1
2. <i>Treatment by immediate operation</i>	9	1	11.1	0	11.1
3. <i>Other cases</i> :—					
<i>a. Manual reduction of strangulated hernia</i>	1	0	0.0	0	0.0
<i>b. Patients moribund on admission</i>	3	3	100.0	0	100.0
Total mortality by patients	45	11	24.4	—	—
Total mortality by cases	51	11	21.5	—	—

A. Aspinall,³ of Sydney, writing on the same subject, also remarks on the fact that the bowels may be got to act in these patients by enemata, giving a false sense of security, especially if pain is also masked by the unwise administration of morphia. "How often has one resident medical officer after another been called from his bed or his billiards to see a patient who is not doing well after operation, each administering the sovereign remedy against further interference with his sleep or pleasure, the result being that when the honorary surgeon calls on his usual rounds he finds the patient almost moribund."

The signs that the abdomen ought to be re-opened are a rising pulse-rate, a falling temperature, and continuing vomiting. Pain is inconstant and distension easy to overlook. "It is better for a few abdomens to be opened unnecessarily than that the high mortality of delay should continue." After releasing the obstruction, nearly always to be found in the pouch of Douglas,

the distended coils are emptied by means of the sucker cannula inserted through a small incision in the bowel wall.

Lawrence Abel¹ speaks well of the value of *acetyl-choline* given in 0.1-grm. doses every six hours for post-operative gas pains or paralytic ileus. It seems probable that it is a strictly physiological remedy, normally present in the body to activate the musculature of the viscera.

Siphon Drainage.—O. Wangenstein and J. R. Paine,^{5, 6} of Minneapolis, contribute two papers, and G. H. Pratt,⁷ of Philadelphia, one, on the use of the duodenal tube to relieve ileus and intestinal obstruction. Either a Jutte tube with a metal tip, or a Levin tube, which is slightly larger and has a soft rubber tip, may be used. It is passed through the nose, and when it reaches the pharynx the patient is told to swallow, which he does with less 'gagging' than when it is introduced through the mouth. About 25 to 30 in. of tube is passed. In a few hours it is usually carried into the duodenum by peristalsis. Holes should be cut in the tube up to 10 in. from the tip, so as to drain both duodenum and stomach. Mere siphonage is almost useless; some form of suction should be used (*Fig. 22*). The fluids and gas that accumulate in the stomach and duodenum are drawn off, and saline solution is administered intravenously by the continuous drip method. If strangulation of the bowel is present, or the colon is greatly distended, this form of treatment, by itself, is of course inadequate. The table opposite shows Wangenstein's results.

Enterostomy for Ileus.—R. Colp,⁸ of New York, points out that when the ileum is involved in pelvic exudates, freeing by direct operation is usually unwise or impossible; in these cases an enterostomy higher up will often tide the patient over until the obstruction recovers, or can be relieved by surgical intervention. In cases of mechanical obstruction, except perhaps as a temporary measure for obstruction due to growths of the colon, it is contra-indicated. It is useless for a genuinely paralytic ileus.

A. Schmechel⁹ gives the experience of the clinic at Cologne. There were 98 ileostomies, by the Witzel technique, in 5450 laparotomies, over five years. It did not help in patients with peritonitis, but saved 12 cases out of 15 in what he calls 'mixed ileus', which was usually a post-operative semi-obstruction.

Statistical articles on the mortality of intestinal obstruction are published by J. Jaki,¹⁰ of Tisza Istvan (70 cases, mortality 40 per cent), A. W. Ssuscewski,¹¹ of Voronesh (121 cases, mortality 38.8 per cent), and C. Ravens,¹² of Kiel (439 cases, mortality 40.3 per cent). It is singular how closely the figures correspond. The British mortality, according to the B.M.A. Report, is also 38.8 per cent. (*See MEDICAL ANNUAL*, 1934, p. 246.)

REFERENCES.—¹*Brit. Jour. Surg.* 1934, April, 582; ²*Jour. Amer. Med. Assoc.* 1934, May, 1733; ³*Med. Jour. Australia*, 1933, Nov., 713; ⁴*Lancet*, 1933, Dec., 1247; ⁵*Surg. Gynecol. and Obst.* 1933, Nov., 601; ⁶*Jour. Amer. Med. Assoc.* 1933, Nov., 1532; ⁷*Amer. Jour. Surg.* 1934, Jan., 148; ⁸*Ann. of Surg.* 1933, Dec., 1063; ⁹*Deut. Zeits. f. Chir.* 1933, Sept., 391; ¹⁰*Ibid.* 1934, Jan., 226; ¹¹*Arch. f. klin. Chir.* 1933, Nov., 101; ¹²*Deut. Zeits. f. Chir.*, 1933, Nov., 668.

INTESTINES, SMALL, SURGERY OF. *A. Rendle Short, M.D., F.R.C.S.*

Diverticula of the Small Intestine.—Several papers have appeared dealing with this subject, and apparently small diverticula of the duodenum or jejunum are not uncommon, may cause flatulent dyspepsia, or may be quite silent, and can be recognized by careful examination of the barium skiagram. According to H. C. Edwards,¹ duodenal diverticula have been found of late years at King's College Hospital in nearly 1 per cent of all patients examined by barium and X rays; they usually occur in the second part.

In three cases reported by R. W. Butler² a jejunal diverticulum perforated and immediate laparotomy was required. *Plate XXVII*, which shows large

diverticula. is taken from his paper. A good discussion of the causation and symptomatology is given by Ian Fraser.³ In his case the diverticula were multiple and showed plainly in the skiagram (*Plate XXVIII*). Symptoms are very variable; vague pains and flatulence, borborygmi, vomiting, or melæna may be present. Patients, mostly males, are generally past middle life.

Meckel's diverticulum, and its misbehaviours, are of course better known. They are discussed anew by R. H. Miller and R. H. Wallace,⁴ who remark that as this anatomical abnormality is present in 2 per cent of the community its situation should always be explored when the abdomen is opened for acute or chronic appendicitis, or other conditions, if the findings are not as expected. H. N. Harkins⁵ describes two cases of intussusception of Meckel's diverticulum and finds 160 in the literature. [There is a specimen of an undescribed case of my own in the museum of the Bristol Royal Infirmary.—A. R. S.]. It occurs in adults, is less acute than ordinary intussusception, with more vomiting but less blood per rectum. A mass may or may not be palpated in the right iliac fossa.

Benign Tumours.—At the Mayo Clinic, according to F. W. Rankin and C. E. Newell,⁶ only 35 cases have been seen. They may, as is well known, start off an intussusception in the adult. Otherwise they cause progressive obstruction, or bleeding, or a freely movable palpable swelling.

Intussusception.—E. M. Miller,⁷ of Chicago, ruefully compares his own mortality of 45 per cent after operation with the 5 per cent deaths reported by Hipsley in Sydney, where an attempt is always made in recent cases to reduce the intussusception by enemata before deciding to operate. (*See MEDICAL ANNUAL, 1928, 243*).

REFERENCES.—¹*Lancet*, 1934, Jan., 169; ²*Brit. Jour. Surg.* 1933, Oct., 329; ³*Ibid.* 1933; ⁴*Ann. of Surg.* 1933, Oct., 713; ⁵*Ibid.* Dec., 1070; ⁶*Surg. Gynecol. and Obst.* 1933, Oct., 501; ⁷*Ann. of Surg.* 1933, Oct. 706.

INTRACRANIAL ANEURYSM.

Geoffrey Jefferson, M.S., F.R.C.S.

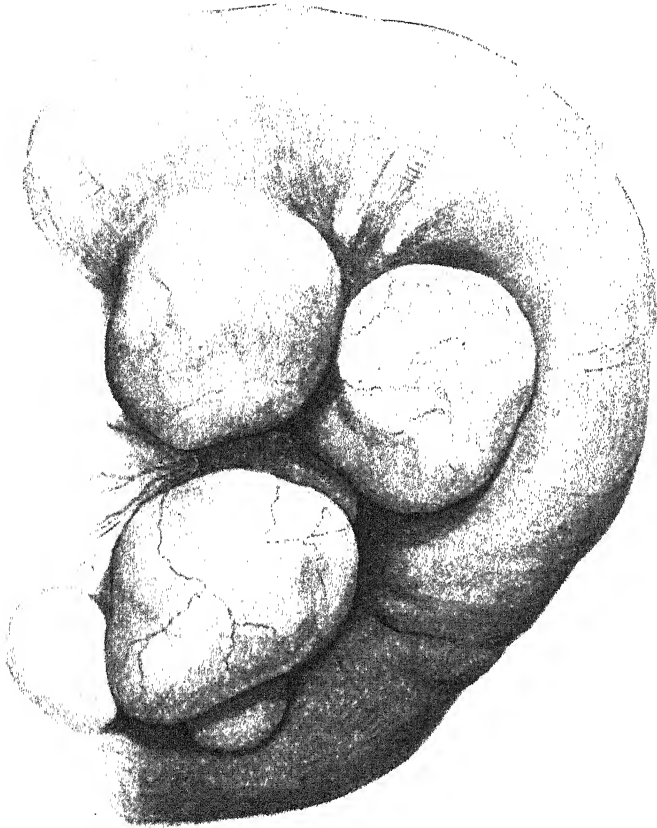
Surgical Treatment of Subarachnoid Hæmorrhage (basal aneurysm).

—The clinical picture presented by subarachnoid hæmorrhage is so definite, and its circumstances are frequently so dramatic, that it has come to be well recognized during the last few years. Many contributions have been made, mostly concerned with the establishment of a syndrome, with the standardization, as it were, of the symptoms and signs. Very little new has been said about treatment. It is known that the patient will often survive the initial hæmorrhage, but that if there is a repetition within a few days or weeks the prognosis becomes definitely graver. The classical treatment has come to be of a purely nursing order, with the addition of lumbar puncture at more or less frequent intervals, especially by those who believe (erroneously) that the number of erythrocytes in the cerebrospinal fluid can be materially reduced by spinal drainage of relatively small quantities of fluid, and by those who believe (still more erroneously) that the blood-pressure and cerebrospinal pressure are intimately associated, and that the former can be lowered by decreasing the latter. W. R. Sprong¹ has worked on the first point, and finds that if a quantity of blood is experimentally introduced into the animal's skull, so little can be removed by spinal drainage that it can hardly ever be of real service as a step in treatment. A lumbar puncture will still be useful in a case of suspected aneurysmal leak and subarachnoid hæmorrhage, for it will usually establish the diagnosis. Moreover, its repetition may be useful in relieving intracranial pressure, for that, if not the blood-pressure, can certainly be lowered by this means. It is, however, clearly wrong to use frequent punctures in the belief that quantities of blood are being got away.

PLATE XXVII

DIVERTICULA OF SMALL INTESTINE

(R. W. BUTLER)



Showing the great size to which diverticula of this type can grow. Small commencing diverticula are also seen. (*Specimen in Museum of the Royal College of Surgeons.*)

By kind permission of the 'British Journal of Surgery'

PLATE XXVIII
DIVERTICULA OF JEJUNO-ILEUM

(IAN FRASER)

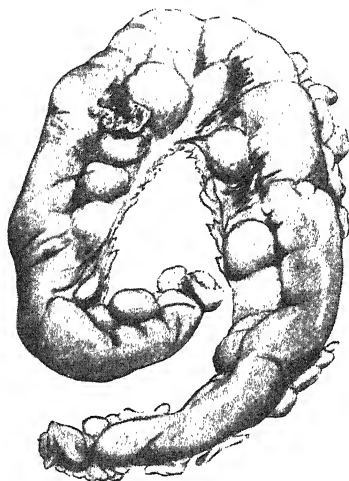


Fig. A.—Sketch of resected portion of bowel showing site of perforation.



Fig. B.—Note three diverticula hanging from intestine (not filled). X-ray taken four and a half hours after ingestion of barium meal.

If lumbar puncture has but a limited field of usefulness, what, then, are we to do for our patients? As has been said, a number of them will make good recoveries if steered through their convalescence by conservative measures, but if the hæmorrhages are repeated and life is again endangered, it is well to have some other means in reserve. In an important paper N. Dott² describes his own experiences with the surgical attack on leaking intracranial aneurysms. He had observed that leakage from one of these small aneurysms of the circle of Willis induced thrombosis within and around the sac, and, furthermore, it was known that such aneurysms can clot and fibrose, to be discovered at some distant necropsy. Dott suggested that if the aneurysm could be exposed it would be good surgery to pack muscle around it, as is so often done in arresting bleeding in the course of an operation for brain tumour or neuralgia. The fact that the majority of the patients are young made the prospects of success greater, for the vessels are usually healthy and the aneurysm a congenitally weak spot at a bifurcation. The project was put to the test in the case of a man of 53 after three severe bleedings in fifteen days. Left oculomotor paresis was present to give evidence as to the approximate site of the aneurysm, and accordingly a left osteoplastic flap was turned down, the left optic nerve found, and the internal carotid artery on its outer side defined. The vessel was followed up to its division into middle and anterior cerebral arteries, and at this point a burst of bleeding revealed the aneurysm. The field was kept clear by suction until muscle-grafts cut from the leg could be packed around it. This stopped any further leak, and the patient made an excellent recovery. He had been subject for many years to attacks of headache and to drooping of the left upper lid at those times. No further such attacks were experienced during the next two years, and up to the time of record the patient was very well.

In another case a decompression was done and a subdural, not subarachnoid, clot found. This led Dott to tie the internal carotid artery with a perfect result. In yet a third case the artery was visualized by injecting thorotrast into the internal carotid (see CEREBRAL PNEUMOGRAPHY AND ANGIOGRAPHY).

Dott divides the forms in which intracranial aneurysms make themselves manifest into three: (1) The apoplectic type, the usual one; (2) The ocular parietic type, generally of the third nerve; (3) The pseudo-tumours. Combinations of these clinical forms may also be met with.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1934, lviii, April, 705; ²*Edin. Med. Jour.* 1933, Dec., 219.

INTRACRANIAL INJURY IN THE NEWBORN.

Reginald Miller, M.D., F.R.C.P.

It is generally agreed that, as a result of the birth process, the contents of the baby's skull may exhibit hæmorrhage (gross or microscopical), œdema and congestion, or contusion; but in individual cases it is by no means easy to determine which kind of lesion is responsible for the alarming symptoms seen in the first few days of life. J. N. Cruickshank's¹ well-known study of 800 neonatal deaths threw doubt on the supposed frequency of small areas of hæmorrhage into the brain in these cases, and stated that hæmorrhage into the substance of the brain does not occur except in unusual circumstances. In his post-mortem records œdema of the brain and meninges was a very constant finding, especially where attacks of respiratory failure had been a feature during life. Although gross hæmorrhage is a common cause of still-birth, we know very little of it as a cause of transient symptoms in the infant following delivery.

Whatever may be the type of lesion present, it results in the occurrence of

raised intracranial pressure with consequent anoxæmia of the medullary centres. Respiratory difficulties may be present from birth, but more commonly symptoms develop gradually in the first two or three days of life. A refusal to feed, with deepening somnolence, often alternating with periods of restlessness and crying, is usually the first manifestation. Recurrent vomiting may occur, the anterior fontanelle is found to be bulging, and frequent twitchings of the facial muscles and limbs are observed. Failure of respiration with attacks of cyanosis is a very constant feature. To summarize, the infant passes into a sort of convulsive state (rather than showing actual convulsions), there are attacks of cyanosis, and the most important sign of bulging of the fontanelle is present.

TREATMENT.—A. Moncrieff² reports excellent results in this dangerous condition from treatment by *rectal injections of hypertonic saline*, following the work of H. Cushing, F. E. B. Foley, and others, who have demonstrated the possibility of reducing intracranial pressure by hypertonic saline given intravenously or per rectum. Moncrieff advises that as soon as any symptoms are observed (or even prophylactically after difficult labour) 2 or 3 oz. of 10 per cent saline should be injected into the rectum, to be retained as long as possible. The injections may be repeated at four-hourly intervals if needed. The injection is easily prepared, as it consists of one teaspoonful of salt in 2 oz. of water: it should be given slowly with a minimum of disturbance, and the buttocks should be held together so as to ensure retention. Ancillary forms of treatment are important: absolute rest, feeding by spoon or tube, $\frac{1}{4}$ -gr. doses of chloral for restlessness or twitching, and 5 per cent carbon dioxide in oxygen through a nasal tube if respiration fails.

Moncrieff has found that this line of treatment is followed in many instances by rapid relief in the symptoms, though it is not to be expected in such cases as are due to actual intracranial hæmorrhage. He has observed that a certain amount of spasticity may remain after the urgent symptoms have disappeared, but this will itself pass off after an interval of two or three months.

REFERENCES.—¹*Medical Research Council, Special Report No. 145, 1930*; ²*Brit. Med. Jour.* 1934, i, 1068.

INTRACRANIAL TUMOURS. (See also PITUITARY BODY.)

Geoffrey Jefferson, M.S., F.R.C.S.

Removal of a Cerebral Hemisphere for Glioma.—Few operations have exceeded in public interest the removal of a cerebral hemisphere containing a malignant glioma. It is over eleven years since W. E. Dandy, of Baltimore, performed this operation for the first time (June 4, 1923); the second case was done on March 16, 1927; the third on Oct. 25, 1927. Recently he has reviewed these three cases,¹ and another has been reported by W. J. Gardner,² of Cleveland. The method is, of course, merely the application of block resection of a mass of healthy tissue containing a malignant tumour, and in its most extreme form consists in the removal of a whole hemisphere. Lesser degrees of it, lobectomy, consist in the excision of frontal, temporal, or occipital lobes of the brain containing tumour. The fact that a patient may survive removal of a whole cerebral hemisphere has excited very great interest even in the lay press, for although it was known that the hemisphere could be removed from animals with but little alteration in their demeanour it was not anticipated that a hemisphere could be sacrificed in man. In all three cases the right hemisphere has been that removed. It is unlikely that anyone would choose to attack the left, because to the hemiplegia which must follow the extirpation would then be added complete aphasia and alexia. The procedure consists in the turning down of a very large bone-flap with the excision of the hemisphere

above the basal ganglia. The ventricle is opened into from the mesial surface after cutting through the corpus callosum, and the whole mass of cortex and white matter external to the optic thalamus removed. Naturally all vessels are first secured. Although the cases are spoken of as total removals of the hemisphere it is likely that some small portions have escaped removal. Dandy, for instance, in the first case left an area of occipital lobe behind, and as the sense of smell was retained it is likely that the olfactory tract and maybe some brain covering it was not touched. The photograph now published of the removed brain shows, however, that practically all, if not quite all, of the right hemisphere external to the optic thalamus and caudate nucleus had been excised. The same is true of the photograph illustrating Gardner's paper.

Such extreme excision of cerebral tissue can only be justified by some exceptional result, and up to the present opinion has not been favourable to the procedure. The fact that Dandy has not apparently thought fit to perform the operation more often, after his own introduction and discovery of it, can only mean that he is doubtful of its practical utility. In the more recent paper referred to he gives the after-history of three cases. The first case rapidly regained consciousness after the operation, and his mental state was essentially the same as before. He had a profound hemiplegia of the left arm and leg. He was well orientated in space, quick and accurate in repartee, and rather fond of punning. Dandy reproduces a perfectly sensible letter which the patient dictated five weeks after the operation. Neurologically the hemiplegia was of flaccid type, the hips could be flexed but not extended, the arm could not be moved, nor the toes and ankle. Anæsthesia of the left side was of the type predicted by Head. The patient (a clergyman) was moved to a Church Invalid Home and died there twenty-six months after the operation. The third case, a woman aged 24, survived only six months, dying of chronic infection in her wound. Prior to that, neurological examination gave: sense of smell, normal; sensation on right side of face, depressed; no deafness whatever although the right temporal lobe had gone; complete palsy of left arm and leg; cutaneous sensation abolished over left arm, trunk, leg. Mentally this patient was not so clear as the first, she joked in a silly way, was inclined to be irritable, and her memory and judgement were defective. The second case also ended in death from infection, but this time after only ten days. Immediately after the operation the patient's mind functioned quite normally for the two days before pyrexia set in. A shorthand record of conversation on the first post-operative day is given, and certainly the greater part of it is very sensible.

To turn now to W. J. Gardner's case. Here he removed the right cerebral hemisphere from a woman, 31 years old, with a malignant parietal glioma (Aug. 31, 1931). His paper is illustrated by excellent photographs of the operative field and of the removed half-brain (weight 520 gm.). A few hours after the operation she talked with friends, but was doubly incontinent for two weeks. Five weeks after the operation she began to walk with support, and it is a remarkable feature of this case that she was able, twenty months after operation, to get about without aid, could go up and downstairs, and frequently went shopping. There was considerable spasticity of hip and knee which interfered with free movement. It is noteworthy that the left arm was completely useless, and this raises some interesting thoughts on the relatively neurologic mechanisms of the human arm and leg. Hearing, as in Dandy's cases, was not affected. The patient's relatives thought her personality and intellectual abilities to be unaltered.

Reflecting on these four cases it is clear that only two of them are capable of analysis; the two which died of infection must be excluded. Evidently

after these very wide removals there is a distinct danger of sepsis setting in, probably owing to the huge dead space left behind. Sepsis must in all probability, therefore, be regarded as a special danger of the operation. After excluding these two cases, we have left the first case of Dandy, and Gardner's. The first died two years and two months later, so that even this huge excision did not prevent a fatality, presumably from recurrence. So far Gardner's patient has not survived long enough for one to be sure that she is finally cured, but if she should be, and if one could rely on the amount of motility achieved in this patient, the operation would be certainly more justifiable than has so far been thought. It is likely that there is no uniformity in the effects of large removals of brain tissue on individual mentality, for some surgeons have had such distressing sequels to removal of one frontal lobe (lobectomy) that they hesitate now to perform this operation. On the other hand, there can be no doubt about the soundness of the pathological principle underlying these steps, and time will prove to us in what degree they are commendable.

Intracranial Tuberculomata.—H. G. Garland and G. Armitage³ record the result of an interesting survey of the pathological material of the Leeds General Infirmary. Their aim was to discover the frequency of intracranial tuberculomata in post-mortem material. They used the records of 13,000 consecutive necropsies during the years 1910–31, including all accident cases and persons brought into hospital dead. Of this number the brain was examined in 3333 cases (27·2 per cent), and the table below gives the frequency of the different pathological conditions of that origin.

Normal	1245	Cerebral abscess	165
Trauma	535	Subarachnoid hæmorrhage	34
Purulent meningitis	373	Hydrocephalus	19
Tuberculous meningitis	356	Cerebral embolism	10
Vascular disease	282	Cerebral thrombosis	5
Cerebral tumour	264	Neurosyphilis	10
Cerebral hæmorrhage	211	Encephalitis lethargica	12

Of the 264 cases of intracranial tumour, no fewer than 89 (33·8 per cent) were tuberculous, which is as surprisingly high as Cushing's figure of 2·8 per cent for operation material is low. At the same time 17·1 per cent of secondary carcinomata is again high compared with Cushing and Bailey's 4·0. Below the age of 20 years 63 per cent of the Leeds cases were tuberculous, and only 16·7 per cent in persons above that age. The cerebellum was involved in 67 per cent of the cases, but not always alone, and this predilection was true of both children and adults. It is important to note that obvious naked-eye tuberculous meningitis was present in 75 per cent of the cases. But on the other hand, of 424 cases of tuberculous meningitis, only 16 per cent were associated with masses of tubercle in the brain. The cause of death in the tuberculomata was uniformly due to the meningitis and not to pressure effects. This was further illustrated by the clinical histories of the proved cases. Garland and Armitage think that the tuberculomata only give rise to symptoms when meningitis develops, the majority of the case histories to death being less than eight weeks. Pyrexia was very common, but there was nothing characteristic about the temperature chart.

This work, with its very high incidence of tuberculomata, runs definitely counter to the figures of most neuro-surgical services, and yet they are perfectly accurate. There must therefore be some other factors which come into play to bring about the remarkable difference between a 34 per cent incidence in Leeds and one of say 3 per cent in tumour clinics (Cushing and Bailey 3·8 per cent in 1500 cases, F. M. R. Walshe⁴ 2·6 per cent in 642 cases). One of these is evident in the Leeds description—namely, the development of tuberculous

meningitis—and it is likely, though the authors do not mention the fact, that a certain proportion of these tuberculomas were diagnosed as meningitis rather than tumours on clinical grounds. The practical clinical point is not so much, what did these cases turn out to be at post-mortem, but under what clinical category did they enter hospital? Almost certainly not as tumours. But assuming that even half of them came in with that diagnosis, there is still another factor which might dilute the figures. It is one that vitiates so many hospital records, and indeed all necropsy records on intracranial lesions—namely, that the patients with gliomata or other intracranial tumours so often die at home rather than in hospital. This is particularly true of children, for if nothing is going to be done surgically for a child with an intracranial tumour, it is almost the universal rule for him to be taken home to die. This is not so likely to happen to the tuberculous meningitis cases, the acuteness of whose sufferings and whose pyrexia plead for continued care in hospital surroundings.

Acoustic Neuromata.—Of all intracranial tumours there are two of which the physical signs are so characteristic that there should rarely be any difficulty in their diagnosis. The pituitary adenomas, one group, demonstrate their presence unmistakably through visual field defects, X-ray changes, and only too often by optic atrophy. The second group, causing unilateral deafness, some disturbance of equilibrium, and later on pressure signs, declare themselves clearly enough as neuromas of the auditory nerve. It is not so many years since tumours in the posterior fossa were classified crudely into intra- and extra-cerebellar tumours, and it is an index of our advance during the last twenty years that this grouping, which seemed to express the height of attainable knowledge at the time, should have so soon become completely obsolete, for the intensive work of neuro-surgery soon demonstrated that the majority of extra-cerebellar tumours are neuromas of the auditory nerve, and that the small residuum of other tumours outside cerebellar tissue is composed of a heterogeneous structural group—epidermoids (cholesteatomas), meningiomas, choroid plexus tumours, and other rare vascular lesions. The intra-cerebellar tumours have been similarly systematized, but no tumour in the posterior fossa carries its diagnosis written upon it with such authority as does that of the acoustic nerve. Cushing's book of 1917 described the symptomatology and pathology so well that there has been no need for comprehensive study, since in addition the tumours are not common and no single surgeon has, as yet, a series in any way comparable numerically with Cushing's.

In a new paper Carl List,⁵ who worked with Cushing for a time, has gone through his acoustic neuroma material and analyses the symptoms and signs, giving percentages of incidence. As is well known, unilateral deafness of, at the moment, unexplained origin is the first symptom, antedating any other by two years according to these new figures. The next happening was the development of headache, which began on an average nineteen months before admission to hospital, whilst three months later cerebellar signs made their appearance. This chronology demonstrates clearly the various stages of development of the neuroma. At first it is so small that it does nothing but compress the auditory nerve; as it becomes larger it blocks the cerebrospinal fluid pathways, raising intracranial pressure, and finally indents the cerebellum. Choked disc was present in practically all of Cushing's now large series (95 per cent). Another important finding, without which no case is clinically perfect, is hypæsthesia in the trigeminal field of the same side (87 per cent) and developing about the same time as the general pressure signs. It is due to the extension of the neuroma inwards towards the hiatus tentorii, which not only blocks the free flow of cerebrospinal fluid but compresses or stretches the trigeminal root. General pressure signs are often insidious in their development,

and so it comes about that too many sufferers from acoustic neuromata are already blind or nearly blind when they come to the neuro-surgeon. The expert neurologist will turn to List's analysis to find the percentage of rare happenings rather than to read his account of the classical signs. Chief amongst the atypical findings is the fact that hearing was unimpaired in 1 per cent. No doubt some degree of hearing persisted in a higher proportion of cases than that. List mentions one case, a woman aged 29, in which even audiometer tests were not positive, yet an eighth-nerve tumour was present. Neuromata of other posterior fossa nerves were very rare—only one verified tumour in Cushing's material on the jugular foramen group of nerves, and none on trigeminus. Meningiomata in the posterior fossa may be mistaken for acoustic neuromata, but were ten times as infrequent, 15 cases as against 175. One last point calls for comment, the rarity of paroxysmal vertigo in auditory nerve tumours. This was certainly true of the Brigham Hospital cases. In a paper devoted to vertigo C. P. Symonds⁶ pointed out that vertiginous crises were uncommon with any form of cerebellar or posterior fossa tumour. The inference is that a patient with severe attacks of dizziness probably has no tumour, and the severer the attacks, the less, in the reviewer's experience, the likelihood.

PERCENTAGE INCIDENCE OF SINGLE SYMPTOMS IN TUMOURS OF THE CEREBELLO-PONTINE ANGLE (C. F. List).

SYMPTOM	NEUROMAS	MENINGIOMAS	GLIOMAS	CHOLESTEATOMAS
Headache	90	88	68	?
Deafness	98	81	72	?
Choked disc	95	81	60	?
Vomiting	55	44	68	?
Trigeminal anaesthesia	87	69	80	25
Facial spasm	6	13	24	15
Facial paresis	59	50	80	?
Cerebellar signs	95	81	96	?
Pyramidal signs	10	38	72	25
Dysarthria, dysphagia	38	50	80	65
Fits	10	6	?	25
Psychic changes	7	—	—	20

TREATMENT.—The operative treatment of the acoustic neuromata is discussed by List⁷ in a second paper. He points out the noteworthy drop in the mortality rate since it became the custom to excise overlying portions of cerebellum, from 18.5 to 4.0 per cent in the last 25 cases. Decompression alone resulted in the highest mortality, 22.2 per cent for supratentorial and 23.1 for suboccipital decompression. The latter combined with radical intracapsular enucleation was followed by a mortality of 11.3 per cent. Only 13 of the 176 cases were totally extirpated. It is interesting to note the rising tally of cranial nerve palsies with the more complete removals—8 cases of injury to the trigeminal root in 27 cases of almost or quite complete removal, 18 cases of facial paralysis in the same group, 5 cases of dysarthria or dysphagia, and 2 with hemiplegia or tetraplegia. These last figures demonstrate that the surgeon should be cautious not to press his radical excision too far but to reserve it for the most favourable cases. [The reviewer believes that the surgeon can rarely say beforehand how much he will be able to do, and that he will be foolish if he tries to inflict a total extirpation on every case. A great deal of nonsense is talked about the radical removals of acoustic neuromata.—G. J.]

Late Results of Intracranial Tumours.—P. Van Wagenen⁵ has conducted an inquiry into the results of the group of cases operated upon during his term as resident in Cushing's Clinic eight years previously. The series consisted of 149 cases of verified tumour-bearers of various kinds. Of these, 80 were gliomas, and all the cerebellar medulloblastomas, the cerebral glioblastomas, and the various kinds of supratentorial astrocytomas and oligocytomatous tumours are now dead after varying periods of survival. On the other hand, of 11 astrocytomas of the cerebellum, 8 were still living, including one first operated upon in 1907, with re-operation in 1924. These tumours give the best results of all intracranial growths, better even than the apparently benign and encapsulated meningiomas, for of 12 such, 7 were dead eight years later. On the other hand, 3 out of 4 suprasellar meningiomas were well at the time of review. Of 11 acoustic neuromas, 7 were alive; of these, 4 were in excellent condition and in full work, and 2 were alive and well but blind. Van Wagenen comments on the fact that patients coming to the neuro-surgeon blind, or so nearly blind that nothing can be done to save their sight, generally have either an acoustic neuroma or a cerebellar astrocytoma. [To which the reviewer would add the anterior basal meningiomas.—G. J.] The only other cases calling for comment are the pituitary group, a very favourable group, 22 out of 26 patients being alive after eight years. The suprasellar cysts of cranio-pharyngeal origin, on the other hand, did surprisingly badly.

Reflection on these results confirms the view that the reviewer has long held—namely, that posterior fossa lesions, apart from the malignant medulloblastomas of childhood, are much more favourable than any hemispherical tumour other than the rare ependymal tumours and a few, but by no means all, of the meningiomas. The histologically moderately benign astrocytomas and oligocytomas are disappointing cases up to the present, but there is no doubt that if they could be recognized earlier (and they have a way of being very slow-growing without pressure signs until years after their commencing to grow) more radical removals could be carried out with appropriate improvement in results. It has often been said that the patient with a tumour near the motor cortex is luckier than one with a tumour distant from it, for the latter is likely to give unmistakable evidence of its presence. But against this must be set the fact that radical removal by wide excision is not possible with the para-Rolandic tumour, for post-operative paralysis is then a certainty. It remains true of the non-invasive meningiomas, but even with these permanent weakness may follow removal.

REFERENCES.—¹*Bull. Johns Hopkins Hosp.* 1933, July, 31; ²*Jour. Amer. Med. Assoc.* 1933, Sept., 823; ³*Jour. Pathol. and Bacteriol.* 1933, xxxvi, 461; ⁴*Quart. Jour. Med.* 1931, xxiv, 587; ⁵*Zeits. f. d. ges. Neurol. u. Psychiat.* 1933, cxliv, 54; ⁶*Lancet*, 1933, Oct., 959; ⁷*Arch. f. klin. Chir.* 1932, July, 282; ⁸*Jour. Amer. Med. Assoc.* 1934, May, 1454.

INTUSSUSCEPTION.

John Fraser, Ch.M., F.R.C.S.Ed.

The subject of intussusception is discussed in a general manner by H. Koster.¹ He introduces the subject by recalling five personal cases in which the intussusception was probably originated by a small adenomatous tumour springing from the wall of the lower ileum. From this point he enumerates the various local errors which may be responsible for initiating the local invagination, such as local ulceration of the gut, inversion of the appendix, and the existence of a Meckel's diverticulum. It is his impression that such influences play but a small part in the origin of the condition, and that the common cause is found in irregular peristalsis of the bowel wall. He makes the interesting observation that from a geographical distribution point of view the incidence of the disease is highest in countries where castor oil is a popular

household remedy. The possibility that over-indulgence of this kind may have an influence was mentioned in 1911 by Koch and Oerun. The remaining part of the paper follows stereotyped lines, and no new facts emerge, but we must join issue with the recommendation that the apex of the intussusception should be examined after reduction by the method of slitting the bowel wall. When we appreciate that the influence of tumour formation in initiating intussusception must be infinitely small, it seems quite unreasonable to suggest such a risky procedure as deliberate incision of the bowel wall. The suggestion is, to put it mildly, an unfortunate one.

W. D. Macfarlane² gives a brief review of 100 cases. He has been impressed by the seasonal incidence of the disease. He finds that the months of April, July, September, November, and December afford the largest number of cases, and he attributes the high proportion at these times to changes in the weather conditions and to festivities. The facts supporting the argument are not convincing, though there is probably a great deal of truth in the theory. He also refers to the significant fact that intussusception is a hospital disease (98 per cent of his cases came under this heading), a statement which may be interpreted as suggesting that dietetic indiscretion originates the trouble. Macfarlane's mortality figures are very good, for a death-rate of 12 per cent compares favourably with records of a similar type.

REFERENCES.—¹*Amer. Jour. Surg.* 1933, Dec. 465; ²*Glasgow Med. Jour.* 1934, March, 77.

JAUNDICE, ACHOLURIC. (See BLOOD DISEASES.)

JAUNDICE, CATARRHAL.

Robert Hutchison, M.D., F.R.C.P.

A. F. Hurst and C. K. Simpson¹ believe that the term 'catarrhal jaundice' has been applied to two really distinct conditions: (1) Cases of gastroduodenal or biliary catarrh with obstruction of the ducts; and (2) Cases of mild sub-acute hepatic necrosis. The term is only correctly applied to the first of these, where the obstruction to the flow of bile is caused by catarrh of the duodenum and lower extremity of the common bile-duct, but most cases diagnosed as catarrhal jaundice really do belong to this group. The initial symptoms are those of an acute gastritis (epigastric discomfort, anorexia, and nausea) with slight pyrexia. Jaundice sets in as these symptoms pass off. In cases of primary hepatic necrosis, on the other hand, there are no pre-icteric symptoms of any kind, jaundice being the first symptom and being accompanied by symptoms of general toxæmia—anorexia, headache, and weakness, with occasional vomiting and diarrhoea. The liver is tender and slightly enlarged, and the spleen is always palpable. The jaundice is generally less than in true catarrhal jaundice, and bile is always present in the stools. The galactose and bilirubin tolerance tests show well-marked hepatic insufficiency.

L. J. Soffer and M. Paulson² have tested the functional capacity of the liver by the bilirubin test in 11 patients who had had 'catarrhal jaundice' within three months to eighteen years previously; 9 showed degrees of retention varying from 10·7 to 50 per cent. They found no relation between the severity of the hepatic damage and the severity of the original attack, but conclude that 'catarrhal jaundice' is not so harmless as is commonly believed, seeing that in a good many instances it is followed by permanent impairment of function. It is difficult to reconcile these results with those of Hurst and Keith Simpson, for they found, using the levulose test, that there was no evidence of hepatic insufficiency in a considerable number of patients who gave a history of a typical attack of catarrhal jaundice some years before.

REFERENCES.—¹*Guy's Hosp. Rep.* 1934, lxxxiv, April, 173; ²*Arch. of Internal Med.* 1934, June, 809.

JAUNDICE, INFECTIVE.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—Numerous outbreaks of infective jaundice have been recorded during the past year in various parts of the world, including England, Holland, France, Greece, Soviet Russia, and French West Africa. N. Hamilton Fairley¹ reports ten cases illustrating that a widespread and hitherto unrecognized focus of Weil's disease has been in existence among the sewer labourers of London for at least twelve years. As the London rats found in the sewers are known vectors of *L. icterohæmorrhagiae*, there were considerable opportunities for infection.

W. G. Willoughby and A. G. Shera² record a case of Weil's disease at Eastbourne in a woman aged 23, in whom the source of infection was not ascertained.

T. M. Montford³ describes an epidemic of jaundice which occurred in Castle Donington, N. Leicestershire, a country town of 2674 inhabitants, in February–September, 1933. With two exceptions all the patients were children. The symptoms were similar to those described in other outbreaks. There were no deaths. Microscopical examination of the urine showed no *L. icterohæmorrhagiae*, but large numbers of a Gram-negative bacillus, which was probably *B. proteus vulgaris*.

N. M. J. Jitta,⁴ who had previously reported an epidemic of 184 cases of spirochætal jaundice with a fatality rate of 8.5 per cent as occurring in Holland in 1932, states that 23 more cases occurred the same year. During 1933 there were 184 cases up to the middle of October, with a fatality of 7.5 per cent. The closure of the swimming baths at Dordrecht, which was one of the towns most affected, was followed by a remarkable fall in the incidence of the cases.

According to G. Vincent⁵ spirochætosis icterohæmorrhagica is endemic in Paris. Males are most affected owing to the nature of their occupation. Most of the patients are young adults between the ages of 30 and 35. The disease is most frequent in the summer, probably owing to bathing in contaminated water.

P. Copanaris⁶ reports an almost simultaneous outbreak of spirochætal jaundice which occurred in the Ionian islands of Cephalonia and Corfu, the source of infection being probably rain water collected in reservoirs infected by rats.

S. Tarassoff⁷ relates the history of infective jaundice in Russia since the first description of it by S. P. Botkine in 1883. The disease is widely diffused throughout the country, and is particularly prevalent among children.

Y. Goetz⁸ carried out the agglutination test for spirochætosis icterohæmorrhagica in 100 natives of French West Africa who had had an attack of jaundice regarded as yellow fever, and obtained a positive result in 17 in titres ranging from 1–5000 to 1–100. He maintains that there is no reason for supposing that the clinical picture of infective jaundice in French West Africa is different from that found in Europe, and points out that the diagnosis from other fevers merely requires the agglutination test.

SYMPTOMS AND COMPLICATIONS.—G. Vincent⁵ states that in addition to the ordinary forms of spirochætosis icterohæmorrhagica the following varieties have recently occurred in Paris: fatal attacks characterized by early jaundice, well-marked hæmorrhages, erythema, and rise of blood creatinin; myoclonic forms; exclusively meningeal forms without jaundice; and a non-icteric type of which the principal feature was polyserositis.

Jitta⁴ describes a case of laboratory infection caused by a small wound produced by opening a culture tube containing *L. icterohæmorrhagiae*. After an interval of a week fever occurred and spirochætes were found in the blood. Two injections of antispiochætal serum were given, and rapid recovery took place.

P. Carnot and J. Weil⁹ report the case of a woman, the subject of melancholia, who developed spirochætal jaundice after attempted suicide by drowning in

the Seine at Paris, where she swallowed a large quantity of contaminated water. Profound anorexia ensued and death took place from inanition. There was no autopsy.

REFERENCES.—¹*Brit. Med. Jour.* 1934, ii, 10; ²*Ibid.* 14; ³*Ibid.* 330; ⁴*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 688; ⁵*Thèse de Paris*, 1933, No. 245; ⁶*Bull. Off. internat. d'Hyg. publ.* 1933, xxv, 1968; ⁷*Ibid.* 1934, xxvi, 690; ⁸*Thèse de Paris*, 1933, No. 546; ⁹*Paris méd.* 1934, i, 438.

JEJUNAL ULCER. (See GASTRIC AND DUODENAL ULCER.)

JOINTS, SURGERY OF. (See also SPINE.)

E. W. Hey Groves, M.S., F.R.C.S.

K. H. Pridie, F.R.C.S.

Temporo-mandibular Joint.—Internal derangement of this joint, or recurrent dislocation, is probably a much commoner condition than is generally supposed. The complaint is a minor one and the patient learns to avoid dislocating the jaw by suitable precautions, and then puts up with what is regarded as a negligible disability.

The mere snapping jaw is usually associated with a rupture or other abnormality of the interarticular meniscus, and the removal of this cartilage should certainly be advised. But true recurrent dislocation of the jaw may be both painful and alarming. Various methods have been suggested for its remedy. Probably in many cases relief would be afforded by merely removing the meniscus. This act will make the socket relatively deeper; but the capsule will be still more relaxed by taking away the cartilage, and the joint is liable again to become displaced. Various other methods have been suggested. Konjetzny¹ frees the posterior attachment of the meniscus, and doubles it up, attaching it like a cushion in the anterior part of the joint, where it would act as a buffer to prevent dislocation. But the success of this will depend on finding an intact cartilage. Nieden² used a strip of temporal fascia which he attached to the condyle of the

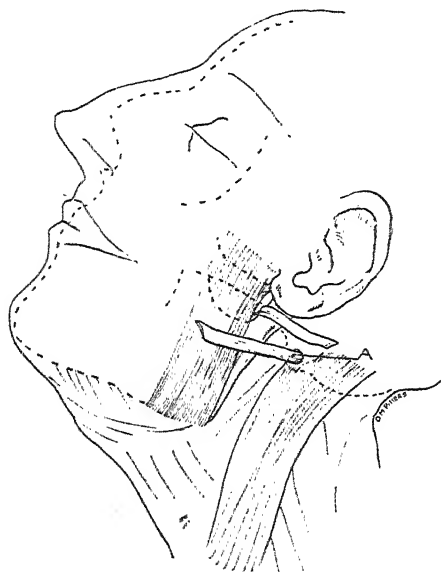


Fig. 23.—Diagrammatic dissection of the neck, showing tendinous sling round the neck of the jaw. A. Hole drilled in mastoid process through which the tendon is drawn. (The parotid gland and facial nerve are not shown for clearness' sake; in the operation the former is drawn forwards, and the latter lies too deeply to be seen.) (From the 'Annals of Surgery')

jaw; but it must be open to doubt whether this fascia is long enough or strong enough for the purpose. The same principle would seem to be more efficiently achieved by the use of one of the forearm tendons, by which the neck of the jaw is tied back to the mastoid process (E. W. Hey Groves³). A horizontal incision is made below the ear $1\frac{1}{2}$ in. long. The neck of the condyle is exposed by blunt dissection, and a tunnel is made right round it by means of an aneurysm needle. A hole is bored through the tip of the mastoid process

by means of a $\frac{3}{16}$ -in. twist drill. A piece of stout silk is threaded through this and round the neck of the jaw. This serves to measure the length of tendon required and as a tractor to pull the tendon into position. A piece of tendon about 3 in. long is taken from the palmaris longus or the brachioradialis. The tendon is drawn through the hole in the mastoid and round the neck of the jaw (*Fig. 23*), pulled tight, and the overlapping portions are sewn together with thread sutures for at least one inch. This operation has the merits of being both simple and effective.

A much more ambitious and difficult operation has been devised and practised successfully by Leo Mayer⁴. It is on the same lines as the bone-block operations employed for genu recurvatum or dropped foot. He employs a local anæsthetic, so that the patient can open and close the jaw during the operation. A horizontal incision is made along the line of the zygoma, back to the ear, and then in front of and over the pinna. One inch of the zygoma is cut away and preserved for future use as a bone-graft. The joint is opened by division of the capsule. A vertical groove is cut in the temporal bone at the site of the eminentia articularis. This groove is of the same width as the bone-graft, and is so shaped that the latter will be held in place as in a mortise, no fixation sutures being necessary. Three successful cases are described. Apart from the technical difficulties of the operation, it has the disadvantage of sacrificing the zygoma and the origin of the masseter muscle.

Shoulder-joint.—The shoulder-joint is not only frequently the seat of dislocation and recurrent dislocation, but it is also very liable to be affected by minor derangements, e.g., rupture or calcification of the supraspinatus tendon, and it is a common site for paralysis of central or peripheral origin. In many of these conditions it is of the utmost importance to secure adequate exposure of the joint. The incision along the anterior border of the deltoid is very unsatisfactory because it gives poor access to the joint and no proper exposure of the great tuberosity.

W. R. Cubbins, J. J. Callahan, and C. S. Scuderi,⁵ in discussing the treatment of *old or irreducible dislocations*, have demonstrated an excellent method of approach and exposure. The incision is made along the anterior deltoid border up to the middle of the clavicle, then along the line of origin of the deltoid as far as the posterior border of the acromion. The origin of the deltoid is cut and the muscle turned down (*Plate XXIX*). This gives complete exposure of the shoulder-joint, the coracoid process, and the acromion, without injury to any important nerve or blood-vessel. This exposure will permit of any exploration or reconstruction of the joint such as that proposed by Cubbins and his colleagues for old dislocation (*Plate XXX*), or any method of arthrodesis or tendon transplantation.

The shoulder is admittedly the most difficult of all the large joints in which to obtain an *arthrodesis*, and yet fixation of the joint is an invaluable method for many painful and paralytic conditions of the shoulder. The difficulty of ensuring fixation is due to two factors: it is hard to secure absolute immobility of the joint and still harder to achieve close firm apposition of the bony surfaces.

R. Watson Jones⁶ has described a new method of arthrodesis which bids fair to be effective in both these directions. He makes a long vertical incision from midway between the clavicle and spine of the scapula down to the middle of the deltoid. The latter is separated from its origin round the margins of the clavicle and acromion. The acromion has both its superior and inferior surfaces rawed, the head of the humerus has the great tuberosity partly split off by an osteotome, the clavicle and acromion are partly fractured a few inches from their extremities, the arm is held in an abducted

position and the acromion with the clavicle broken downwards and made to engage in the split in the humerus (*Figs. 24, 25*). The wound is closed in layers and the limb put up in a plaster spica in a position of 80° abduction, 30° forward flexion, and 30° external rotation. A plaster case is worn for

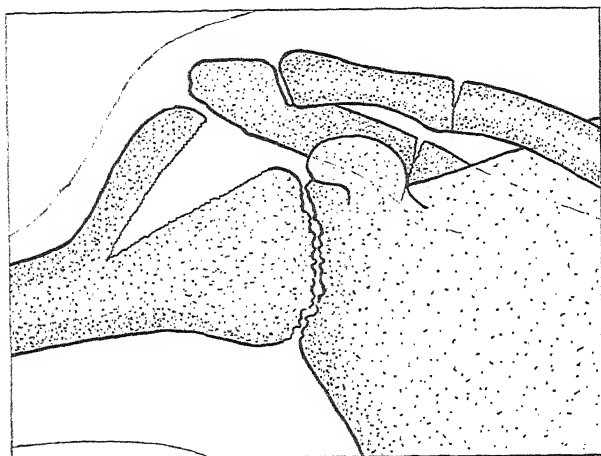


Fig. 24.—Arthrodesis of the shoulder. Greater tuberosity partially separated from humerus; clavicle and acromion partially fractured.

(*Figs. 11-18 by kind permission of the 'Journal of Bone and Joint Surgery'.*)

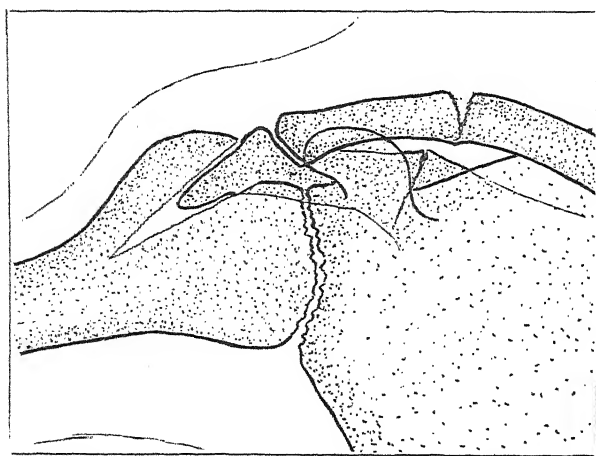


Fig. 25.—Arthrodesis of the shoulder. Acromio-clavicular mass angulated downwards and wedged into gap in humerus.

four months, and this is followed by an abduction frame. The result is shown in *Plate XXXI*.

This operation has been devised primarily for the treatment of tuberculosis of the shoulder in adults. The joint itself is not opened, and the whole

PLATE XXIX

EXPOSURE OF THE SHOULDER-JOINT FOR OLD DISLOCATION

(W. R. CUBBINS, J. J. CALLAHAN, AND C. S. SCUDPER)

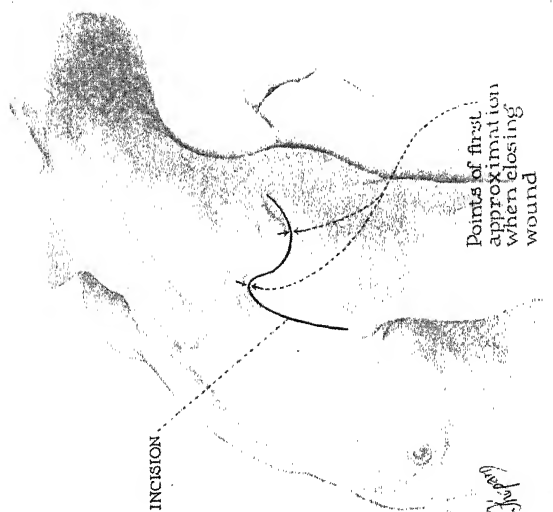


Fig. 4.—Incision is made between anteromedial border of the deltoid and the pectoralis major, anterior and medial to the dislocated head of the humerus, is extended up to the middle of the clavicle, then around the clavicle, acromion, and two inches on the spine of the scapula. Slight cross-incisions are made at arrow points to aid correct reapproximation of deltoid.

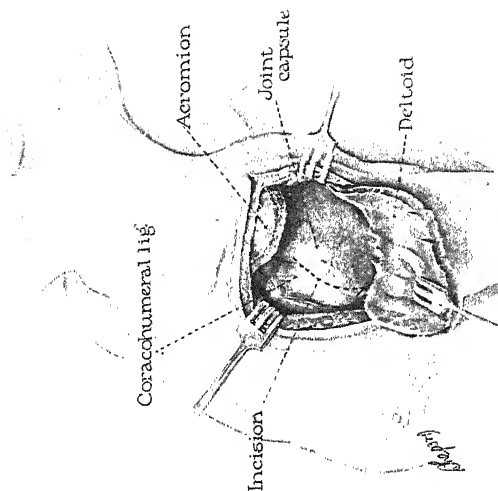


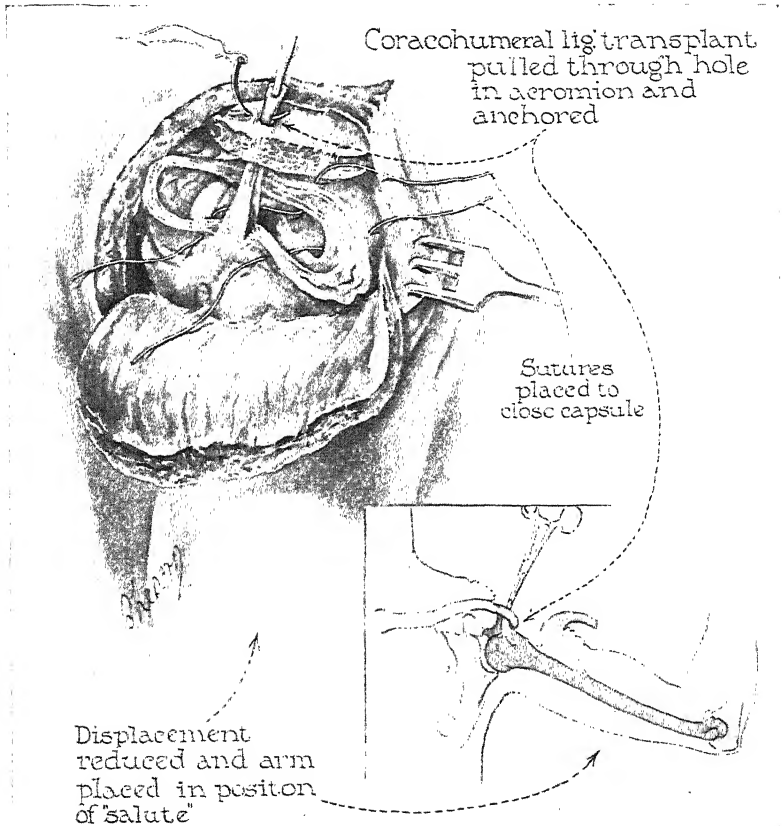
Fig. 5.—Deltoid and skin-flap reflected down to expose empty glenoid, flattened capsule, and coracoid process, with muscular and tendinous attachments.

*By kind permission of
Surgery, Gynecology and Obstetrics.*

PLATE XXX

EXPOSURE OF THE SHOULDER-JOINT FOR OLD
DISLOCATION—*continued*

(W. R. CUBBINS, J. J. CALLAHAN, AND C. S. SCUDERI)



The coraco-humeral ligament is pulled through the drill-hole in the acromion for humeral fixation after reduction. Inset shows the position in which the humerus is dressed. The cut edges of the capsule are approximated with catgut sutures.

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PLATE XXXI

EXTRA-ARTICULAR ARTHRODESIS OF THE SHOULDER

(R. WATSON JONES)



X-ray six months after excision of joint and combined intra- and extra-articular arthrodesis. (In this case the clavicle, as well as the acromion, has been freshened and impacted into the humerus.)

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PLATE XXXII

ARTHRODESIS OF THE SHOULDER

(A. L. BRETT)



Skiagram taken four months after arthrodesis, showing bony union, with arm in approximately 75° of abduction and 20° of anterior flexion. Note graft in place, with beginning of absorption.

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procedure is an extra-articular arthrodesis. It is obvious that it would be equally suitable for other conditions where the joint has been rendered painful and useless by trauma or osteo-arthritis. In such the capsule would be opened and the joint surfaces removed.

A. L. Brett⁷ also describes a method of arthrodesis which involves the use of an autogenous bone-graft. He exposes the joint through a vertical incision splitting the deltoid, and removes the articular surfaces of the humerus, glenoid, and the under surface of the acromion. He then drills a hole $\frac{1}{4}$ in. in diameter from just below the greater tuberosity through the humeral head, glenoid, and into the spine of the scapula. Into this hole a freshly cut tibial graft is driven (Fig. 26). The arm is put up in a plaster spica for two months. *Plate XXXII*

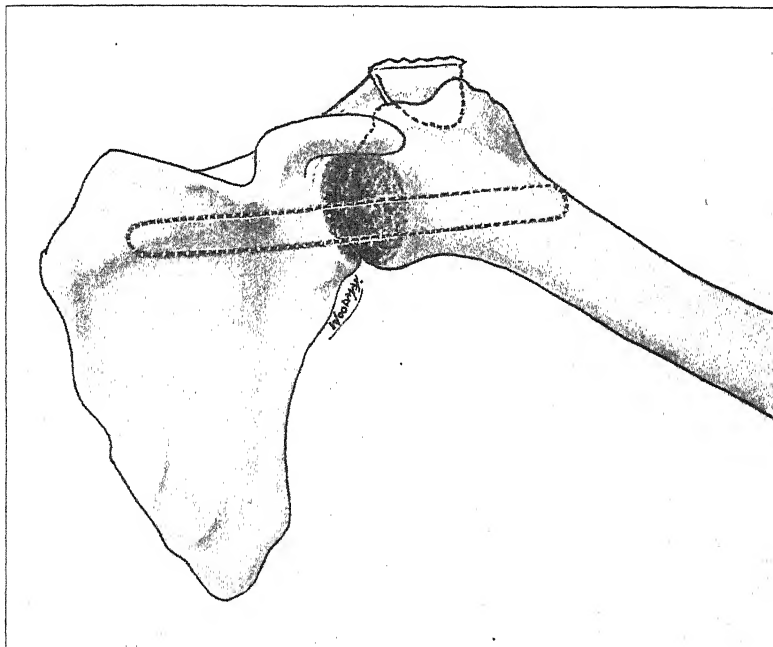


Fig. 26.—Arthrodesis of shoulder. Tibial graft in position.

shows such an arthrodesis four months after operation. [No doubt the use of the bone-graft will help to promote new bone formation, but there certainly will be a great risk of the comparatively slender graft breaking if any strain is put on the fixed joint before bony union is complete.]

The Elbow-joint.—The problem of mobilizing the stiff elbow is one of great difficulty, requiring very sound judgement and the maximum of technical skill. A patient with an elbow soundly ankylosed in good position will seldom require an arthroplasty, because it will always be doubtful whether any gain in mobility will compensate for a certain loss in stability. But in many cases the ankylosis is neither sound nor in good position. This is especially the case after injuries to the elbow-joint resulting in some degree of painful fibrous union, which may be both extra- and intra-articular.

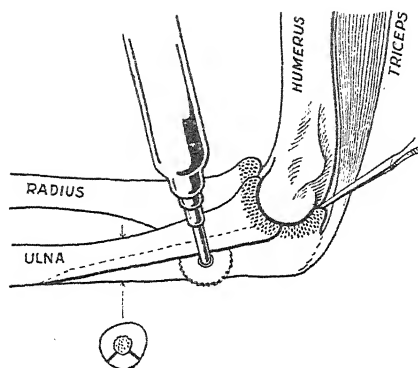


Fig. 27.—Diagram showing converging saw-cuts on upper posterior surface of ulna, including whole olecranon process.

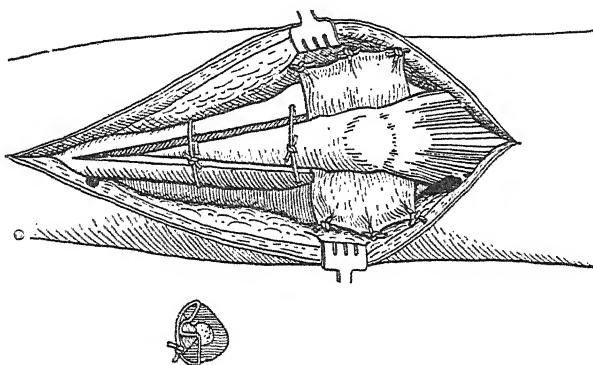


Fig. 28.—Fascia-fat graft sutured in place and olecranon replaced in its gutter.

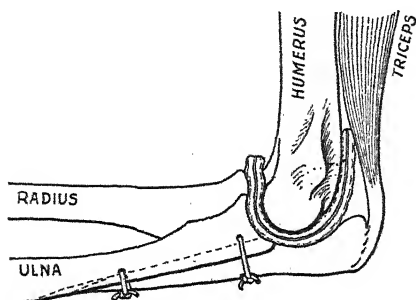


Fig. 29.—Lateral view, showing newly formed joint with an adequate olecranon lever.

In the ordinary operation of *arthroplasty* of the elbow, an excision of the joint surfaces is made and union of the bones is prevented by the interposition of free fascial grafts. Certain mobility can be secured by a free removal of the bone-ends, but this is liable to be followed by a flail joint. F. H. Albee⁸ has suggested a modification of the usual technique in which, by an elongation of the olecranon process, greater leverage will be given to the extensor muscles of the elbow, and therefore there will be greater stability of the joint. An incision about 4 in. long is made from the tip of the olecranon down the crest

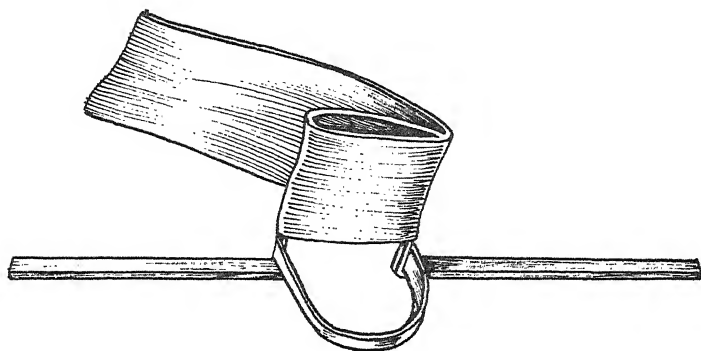


Fig. 30.—Forrester-Brown's splint for reduction of dislocations in infants under one year.

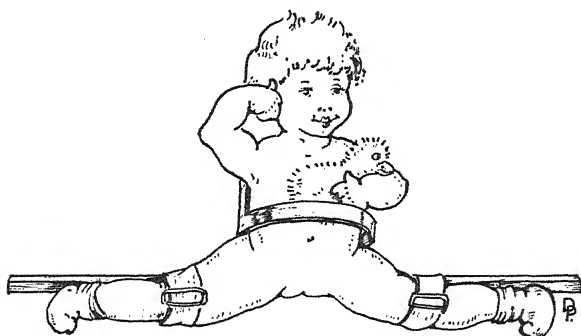


Fig. 31.—Abduction splint for cases under one year old (shown on a doll). Body binder not shown.

(Figs. re-drawn from the 'British Journal of Children's Diseases'.)

of the ulna. The olecranon and about $3\frac{1}{2}$ in. of the posterior crest of the ulna are cut away by two cuts which converge both longitudinally and laterally (Fig. 27). This piece of the ulna is turned up with its attachment to the triceps tendon, and the joint is exposed, its surfaces are cut away and smoothed and then covered by a piece of fat-covered fascia taken from the thigh (Fig. 28). The separated piece of ulna is then fixed in position at a higher level than it originally occupied so as to afford it greater leverage action (Fig. 29). The arm is put up in a plaster cast extending from the base of the fingers

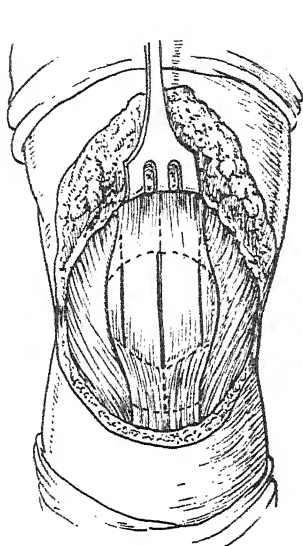


Fig. 32.—Showing cuts in patella and ligamentum patellæ.

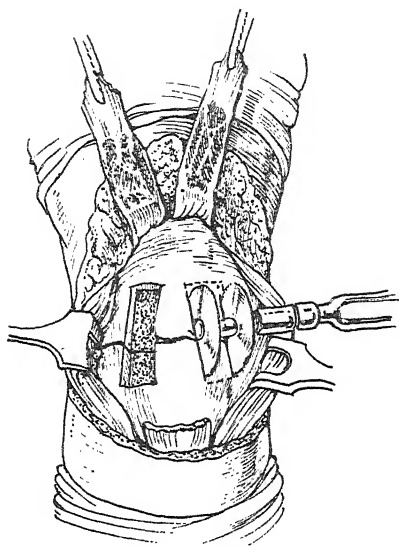


Fig. 33.—Grooves being cut in femur and tibia.

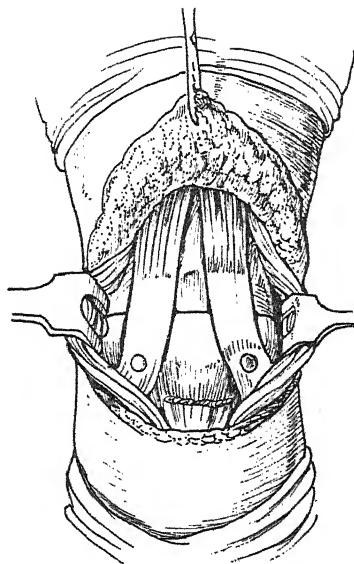


Fig. 34.—Patellar fragments fitted into grooves and nailed in position.

Figs. 32-34.—ARTHRODESIS OF THE KNEE-JOINT (G. Mocchia).

(Re-drawn from 'La Chirurgia degli Organi di Movimento'.)

to the axilla, the elbow being in the flexed position. The cast is left in place for three weeks, after which massage and manipulation are begun and carried out daily for one month.

Congenital Dislocation of the Hip.—The intensive study of this condition carried out in Bologna and Northern Italy by Professor Putti has resulted in a much earlier diagnosis. And further, it has been shown that if the condition can be recognized during infancy—i.e., before the child is one year old—it is possible to correct it by the simple expedient of keeping both legs widely abducted to a right angle for six to nine months. M. Forrester Brown⁹ discusses the early diagnosis. Obviously it is not practicable to have an X-ray of every infant, and the question is what signs should raise enough suspicion of dislocation of the hip to justify an X-ray. These are: asymmetry of the skin folds on the inner side of the thighs; absence of the head of the femur from under the femoral artery; presence of a deep hollow in the groin when the knee is bent up and out; shortening of one limb as judged by the level of the patella; constant outward rotation of the leg when the child is asleep; and widening of the hip outline on one or both sides.

When the diagnosis has been confirmed by X-rays, a simple metal frame splint is applied which half encircles the body and holds the upper sides of both legs in extreme abduction (*Figs. 30, 31*). It is claimed that this splint is easily applied and can be re-applied by the parent after the bath.

Arthrodesis of the Knee-joint.—There are many conditions following paralysis, disease, or injury of the knee, in which it is desirable to produce a firm ankylosis without appreciable shortening of the leg. A notable contribution has been made to the technique of this operation by G. Moccia,¹⁰ which depends upon the utilization of the patella as two anterior bone-grafts. The knee-joint is exposed by a U-shaped flap with its base upwards and its apex reaching to the ligamentum patellæ. The latter is divided and the patella is turned up. The contiguous surfaces of the femur and tibia are then excised, most of the bone being taken from the femur. The patella is split into two equal halves by a longitudinal cut, whilst the lateral margins of each half are also removed. This cutting of the patella into two equal parallelograms is most conveniently done whilst it is still in position held firmly by the ligamentum patellæ. The articular surfaces of the patella are removed by a chisel. After the articular surfaces of the femur and tibia have been removed, the limb is placed in an extended position and the two halves of the patella are pulled down in a diverging position over the front of the articulation. The positions in which they lie are marked, and a corresponding groove is cut in the femur and tibia by means of a twin saw. The patellar fragments are then placed in the grooves prepared for them and fixed by bone nails driven through the pieces of ligament attached to their lower ends. (*Figs. 32-34*.)

REFERENCES.—¹*Arch. f. klin. Chir.* 1921, cxvi, 681; ²*Deut. Zeits. f. Chir.* 1923, clxxxiii, 358; ³*Ann. of Surg.* 1934, July, 20; ⁴*Jour. Bone and Joint Surg.* 1933, xv, Oct., 889; ⁵*Surg. Gynecol. and Obst.* 1934, lviii, Feb., 129; ⁶*Jour. Bone and Joint Surg.* 1933, xv, Oct., 862; ⁷*Ibid.* 969; ⁸*Ibid.* 979; ⁹*Brit. Jour. Child. Dis.* 1934, Jan., 17; ¹⁰*Chir. d. Org. di Mov.* 1933, xviii, Sept., 254.

KALA-AZAR.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—The experimental transmission of kala-azar to hamsters by the bite of sandflies is dealt with by L. E. Napier, B. O. A. Smith, and K. V. Krishnan.¹ They commence by stating that all attempts hitherto to infect "human volunteers and other animals" with kala-azar by the bite of the *Phlebotomus argentipes* have failed, but they immediately go on to quote the well-known successful infection of a hamster in this way by Shortt and others. A review of earlier attempts by the present writers and others shows that in

nearly all the unsuccessful attempts the animals had not been kept alive as long as 400 days, while in Shortt's positive case infection was demonstrated after 511 days. They now record two further successful transmissions through the bite of *P. argentipes* of kala-azar to hamsters after the lapse of 482 and 419 days respectively, thus confirming Shortt. In a further paper² they report the results of numerous experiments to determine the relative infectivity of the hamster by different routes of the administration of the rounded human stage of the parasite and of the cultivated flagellate stage. They conclude that of the five methods tried—namely, intraperitoneal and subcutaneous injection, the oral, percutaneous, and conjunctival routes—in all but the last the flagellate form is most infective, and that a high percentage of positive results is obtained in all but the conjunctival method, with most successes by the intraperitoneal and subcutaneous routes, and next by the oral, while the parasite readily enters through an abraded skin. Hamsters can be readily infected by comparatively small single doses. In a third paper³ the same investigators report that previous infection with malaria rendered *Macaca iris* monkeys much more susceptible to experimental infection by kala-azar, but no such effect could be demonstrated in the case of *Macaca mulatta*.

CLINICAL.—L. E. Napier and R. O. A. Smith⁴ also report on a search in kala-azar infected areas of Assam for the dermal form of leishmaniasis they have found to be so common after the treatment of kala-azar in Bengal; it is also frequent in Madras, but they found very few such cases in Assam, and they consider this provides further evidence for the theory that the dermal lesions are phenomena of 'host-parasite adjustment'. Further observations during the last three years on post-kala-azar dermal leishmaniasis is reported by L. E. Napier and C. R. Das Gupta⁵ from the Calcutta School of Tropical Medicine. Including cases already recorded, 394 have been met with, a number of which had been erroneously diagnosed as leprosy—a mistake which is very excusable in the absence of facilities for microscopical examinations, as shown by several of the nine photographic illustrations in this comprehensive article. The authors classify the clinical types met with as depigmented areas, erythema or butterfly rashes, nodules, verrucose, papillomatous, hypertrophic, and xanthoma types, the first three of which are the common ones; but no fewer than 116 of 200 cases so classified were mixed ones with the easily recognized nodules together with lesions of other types, which greatly facilitates the verification by the use of the microscope. Among unusual clinical types are lesions on the mucous membrane of the mouth, somewhat resembling the South American espundia; small ulcerated lesions on the nose, somewhat similar to oriental sore; and post-onychial induration. A history of a prior attack of kala-azar was obtained in 82.5 per cent, and the mean incubation period varied in two series from 1.88 to 2.32 years. The great majority of the cases occurred between the ages of 10 and 40 years, and among 2500 treated kala-azar cases 29 (1.16 per cent) attended again for the dermal form, and there must have been many more who did not come back, for among 120 village kala-azar patients re-examined, 6 had definite dermal lesions, so the incidence is probably about 5 per cent. Prolonged courses are necessary of not less than twenty injections, given two or three times a week, preferably with *neostibosan*, and *fouadin* may also be of value, and with prolonged treatment even the most obstinate cases will eventually clear up.

In a short note S. Lal and J. R. Dogra⁶ conclude that the infection of cutaneous leishmaniasis spreads along the lymphatics. The type of the anaemia in kala-azar is discussed at length by L. E. Napier and L. R. Sharma,⁷ whose observations are in general agreement with those of others. They found the reticulocyte count to be increased from the normal of 0.42 per cent to a mean

percentage of 2.07; it fell after the use of neostibosan. The mean colour index was 0.885 before and 1.005 after treatment, and halometric readings showed the size of the red corpuscles to be 7.559μ before and 7.216μ after treatment. The resistance of the red cells to the action of hypotonic saline was increased before treatment only, the Arneth count showed a very marked shift to the left, and there was a distinct increase in the urobilin before treatment. Hæmatinic drugs had little influence, and the authors conclude that the anæmia is essentially due to the primary infection and not to secondary causes. The same workers⁸ record a few observations on the anæmia in hamsters infected with kala-azar, with blood changes closely similar to those in man. R. O. A. Smith⁹ reports the occurrence of cancrum oris in a *Macaca iris* monkey infected with kala-azar, very similar to that which occurs in kala-azar infected children.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1933, Oct.; ²*Ibid.* 299 and 305; ³*Ibid.* 1934, Jan., 553; ⁴*Ibid.* 1933, 557; ⁵*Ind. Med. Gaz.* 1934, March, 121; ⁶*Ibid.* 1933, Nov., 628; ⁷*Ibid.* Oct., 545; ⁸*Ibid.* Dec., 690; ⁹*Ibid.* Aug., 455.

KIDNEY. (See also RENAL DISEASES.)

KIDNEY, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Congenital Cystic Kidneys (*Polycystoma*).—

CLINICAL FEATURES.—*In the fœtus* the kidneys may be so large as to obstruct labour. Such a case was encountered by J. Denton.¹ *In the child* the bilateral swellings of congenital cystic kidneys must be distinguished from those of bilateral Wilms' tumours (malignant embryomata). *In the adult* there are five clinical types:—

1. *Insidious*.—The large 'nobbly' kidneys when discovered in the course of a routine examination can hardly be mistaken.

2. *Uræmia*.—The patient presents himself with symptoms of uræmia.

3. *Nephroptosis*.—Especially on the right side, the very weight of the cystic kidney causes the organ to descend, and symptoms of nephroptosis may result.

4. *Renal Tumour*.—One kidney contains larger cysts than the other, and gives rise to physical signs of a renal new growth.

5. *Hæmaturia*.—Congenital cystic kidney occasionally causes painless hæmaturia, a symptom which, as H. Bailey and R. J. M. Love² point out, may in this instance entrap even the very elect.

There is a definite hereditary factor in this disease and it is not sex-linked; an affected male or female can equally transmit the disease (C. H. Reason³). Those cases which survive until adolescence have an expectancy of life of about thirty more years (W. F. Braasch and F. W. Schacht⁴). Often the disease does not show itself until the age of 30 to 45. The most regular syndrome is gradually developing renal insufficiency and a copious diluted urine with or without high blood-pressure (R. Platt⁵).

TREATMENT.—The contention that surgical treatment of congenital cystic kidneys is seldom, if ever, indicated is, according to W. Waters and W. F. Braasch,⁶ quite erroneous. From their experience at the Mayo Clinic they find that polycystic kidneys are very liable to complications which require operation. Before undertaking any renal operation (other than a dire emergency) renal function must be tested. Congenital cystic kidneys behave curiously to these tests. Usually there is considerable delay in the excretion of dyes such as indigo-carmin, while the value for blood-urea may be normal or but slightly elevated. If the blood-urea is raised more than 40 to 60 mgrm., the advisability of operation is open to question, except as an emergency measure. Excretion pyelography is a comparatively accurate index of renal function in these cases. Adequate visualization of the pelvis of but one kidney can often

be regarded as sufficient evidence of normal renal function to warrant the removal of the other. The common indications for surgical intervention in the case of polycystic kidneys are as follows:—

Pain.—Usually a dull, continuous ache, caused by: (1) Increased intracystic pressure; (2) Haemorrhage into the cysts; (3) Drag upon the renal pedicle. As a rule pain is relieved by Rovsing's operation, which consists of exposing the kidney, puncturing the cysts, and enucleating any particularly large cysts which are suited to the latter measure.

Haematuria.—Fifty per cent of the 193 patients with polycystic kidney under review in the Mayo Clinic suffered from haematuria. The combination of haematuria with a solid renal swelling in the lateral upper abdominal quadrant is so suggestive of renal neoplasm that surgical exploration, and even nephrectomy, have frequently been reported before the true condition was recognized. When haematuria is severe or continuous, operation is indicated. Again Rovsing's operation often brings relief, particularly when the cysts are large. In other cases where the renal parenchyma is largely destroyed and the contra-

lateral organ is adequate, nephrectomy is advised. Polycystic kidneys are particularly liable to infection. W. Waters and W. F. Braasch find that chronic renal infection almost amounting to a pyonephrosis was the most frequent reason for nephrectomy.

Solitary Cysts of the Kidney.—

Although they have been observed in children, solitary cysts of the kidney usually occur after the age of 40. Women are rather more often affected. The symptoms are vague and are unlikely to obtrude themselves until the cyst has attained considerable dimensions. When the cyst is situated at the upper pole B. E. Greenberg and L. M. Brodney⁷ find that the symptoms are those of chronic cough and pain in the chest and shoulders. When the cyst is in the lower pole (*Fig. 35*) the symptoms are those of any retroperitoneal swelling. Pressure on adjacent viscera gives rise to epigastric pain and vomiting, and in a case recently under the care of the reviewer the symptoms were identical with gall-

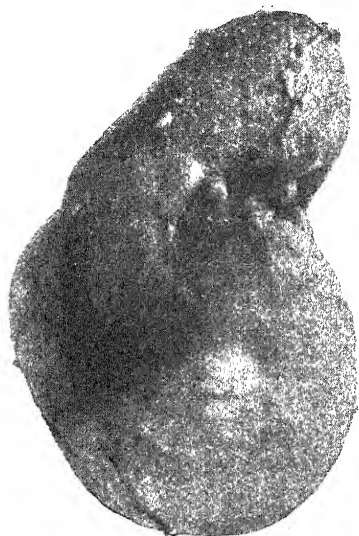


Fig. 35.—Solitary cyst of kidney. (F. W. Gifford Nash.)

stones. All renal function tests are usually negative. Pyelography often shows a normal renal pelvis, although, as Greenberg and Brodney point out, with a good X-ray picture the cyst can sometimes be made out in relation to the kidney outline. In a few cases with pyelography there is a filling defect of the upper or lower calices and the condition is thought to be a renal neoplasm. The cyst is lined by flattened epithelium and contains a watery fluid containing a small amount of albumin (F. W. G. Nash⁸). Complications sometimes occur. Rupture may take place into the renal pelvis and give rise to alarming symptoms, as in the case described by H. M. M. Wynne,⁹ or into the tissues about the kidney, giving rise to perirenal extravasation (W. Block¹⁰).

TREATMENT.—The cyst wall appears to be always blended intimately with the kidney substance, making enucleation in the accepted sense impossible. The treatment of solitary cyst of the kidney is excision of the cyst, which can be carried out as a partial nephrectomy, removing a wedge of kidney substance, preferably with an electro-surgical knife (W. S. Pugh¹¹). An alternative, but somewhat less satisfactory, method is to remove the cyst as far as possible and destroy the remaining cyst wall with a cautery.

Renal Calculus.—

ETIOLOGY.—Albino rats are normally free from urinary calculi. When they are fed on a diet deficient in vitamins A and D, in a considerable number of instances renal and vesical calculi develop (A. R. Bliss et al.¹²). Other workers have repeated these experiments with the same results (C. C. Higgins,¹³ W. Grossman¹⁴). On this vitamin-deficient diet the urine soon becomes alkaline, and commonly becomes infected by staphylococci. Clinically one can utilize the results of these experiments by feeding patients who have passed or had urinary calculi removed on a diet rich in vitamins A and D. A. Rautenberg¹⁵ considers that many calculi encountered in adults have their origin in childhood directly due to a metabolic upset, the result of a vitamin-deficient diet.

Renal Calculi and Fractures.—For many years it has been known that patients suffering from fractures are somewhat prone to develop renal calculi, but the reason for this association was far from clear. R. K. L. Brown and M. S. S. Earlam¹⁶ showed that it is not so much the fracture as the immobilization which is the predisposing cause. Any patient immobilized for a long period is a candidate for a renal calculus—for instance, it is equally common amongst sufferers from Pott's disease as amongst those with a fractured femur. R. W. Jones and R. E. Roberts¹⁷ write in the same vein, and they go further by showing that prolonged immobilization leads to skeletal decalcification. Continued excessive excretion of calcium by the kidneys probably causes renal degeneration. A recumbent position definitely hinders drainage of the pelvis. These are two significant etiological factors in stone formation.

Visualization of Non-opaque Renal and Ureteric Calculi.—Nearly one-third of all calculi in the upper urinary tract fail to yield X-ray shadows. When, in spite of a negative X-ray, a stone is suspected, M. Scalitzer and R. Bachaach¹⁸ advocate the routine use of a small quantity only (e.g., 2 to 3 c.c.) of the instrumental pyelographic medium, instead of filling the pelvis completely in the usual way. By following their technique calculi which were not demonstrable with the plain X-ray are visualized clearly. It is important to avoid injecting a bubble of air, which may vitiate the result.

Bilateral Renal Calculi.—Opinions differ as to what to do when stones are bilateral. Some recommend surgical intervention only in cases in which anuria or other similarly menacing complications call for an emergency operation. Other surgeons, now in the majority, favour early removal of the stones on both sides. Fearing that the double operation would prove too much for the patient and that the enterprise might lead to anuria, nearly all these operators remove the stones at two sittings. The first surgeon to perform bilateral nephrolithotomy at one sitting was V. Blum in 1923. In 1930 T. Hryntschak, of the Wilhelminan Hospital in Vienna, was able to report 13 cases so treated by Blum and himself, with no deaths. In a recent paper Hryntschak¹⁹ sets out the advantages of the one-stage operation—it obviously presents many advantages—but he emphasizes that it is not applicable to every case of bilateral renal calculi where operation is advised. Touching on the dread of producing anuria he says: "Many authors fear that after a one-stage operation both kidneys may stop functioning for some time and that anuria will result. Truly this never happens. Even after bilateral

nephrotomies carried out in the morning, the urinary function usually begins again in the afternoon, and the urine collected through the nephrostomy drains becomes macroscopically blood-free on the second, sometimes on the third, day after operation. Naturally the patient must be given a large amount of fluid."

H. P. Winsbury-White²⁰ states that the average age of patients with bilateral renal calculi is somewhat higher than that of the unilateral condition.

Recurrent Renal Calculi.—By following up a large series of cases of renal calculi after operation at the Clinic of Professor Key, of Stockholm, J. Hellstrom²¹ finds the recurrences are more frequent: (1) In the case of multiple calculi; (2) When the calculus was soft and broke during removal; and (3) When an effort has been made to save the kidney in a case where the stone was large and branching. In the latter group nephrectomy is often a better procedure. Recurrence of the stone is more common when the urine is infected with staphylococci than in cases where other organisms predominate. W. M. Eccles²² reports a case of nephrolithotomy performed twice on each kidney. The patient has had no recurrence for the past seventeen years, and is now well over 60 years of age.

Nephrolithotomy.—O. S. Lowsley and C. C. Bishop²³ have introduced a new suture material for repairing kidney wounds after nephrolithotomy. It is a flat ribbon of catgut. This suture material is applied around the kidney looped under its capsule. The technique is fully illustrated in the article.

After removal of a renal calculus, especially when the kidney is infected, H. P. Winsbury-White²⁴ advocates temporary nephrostomy. The nephrostomy tube should be left in place for at least a week. The advantages of the electro-surgical scalpel (*Plate XXXIII*) in nephrolithotomy are set forth by W. S. Pugh.²⁵ Incision of the kidney with this instrument is accompanied by much diminished hæmorrhage.

The Treatment of Acute Uræmia.—If the bladder is distended from retention of urine the first step must be to decompress it slowly (*see* BLADDER, SURGERY OF).

Mild Uræmia.—The patient should be encouraged to drink as much fluid as possible, and the fluid intake may be supplemented by a rectal drip of tap water. Urinary antiseptics are prescribed as the needs of the case demand. The total amount of urine excreted during each twenty-four hours must be measured and charted. It is advisable to have the blood-urea estimated and to watch the patient carefully for signs of renal failure.

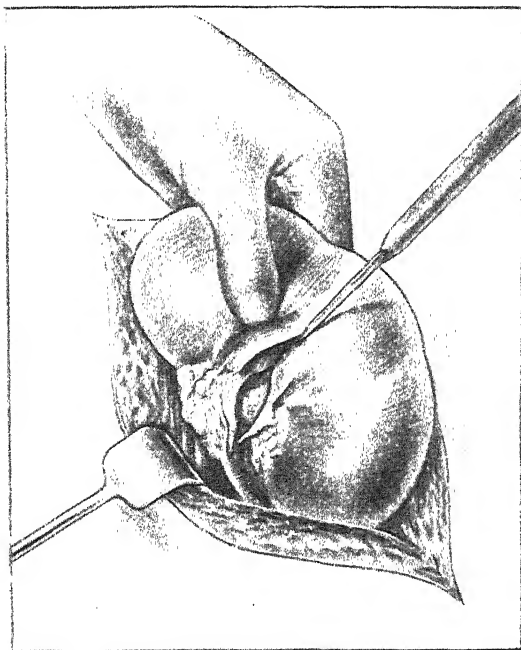
Severe Cases.—Sweating merely depletes the tissues of much-needed water and salts; as a means of ridding the patient of urea it is puerile. Diaphoretics are therefore useless, and even harmful. What the patient requires is a diuretic, and there is no better diuretic in the pharmacopœia than the continuous administration of saline and glucose. It is therefore strongly advised to administer this without delay.

Desperate Cases.—Commence with venesection. Withdraw half to one pint of blood, then introduce a continuous intravenous saline needle and allow half to one pint of saline and glucose to run into the vein fairly rapidly. When the volume of circulating blood has been restored, cut down the rate to the regulation 25 drops per minute. If improvement in the general condition and the outflow of urine is not manifest within six hours, further venesection followed by a blood transfusion should be entertained. At this juncture the advisability of decapsulation of the kidneys—a most difficult question—must receive consideration. If the patient's general condition is even moderately good and the foregoing treatment has failed to produce an adequate output of urine, decapsulation offers the only hope of a successful issue.

PLATE XXXIII

ELECTRO-SURGERY IN NEPHROLITHOTOMY

(W. S. PUGH)



Extension of a pyelotomy incision, using the electro-surgical scalpel. If an ordinary scalpel was employed the resulting hemorrhage would be torrential.

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'Urological and Cutaneous Review'*

It could more often be said of uræmia '*Veni, vidi, vici*,' if the physician's watch-word in these cases was "Decompression, venesection, venoclysis". (H. Bailey.²⁶)

Renal Tuberculosis.—*Can a kidney in which no tuberculous lesion exists excrete tubercle bacilli?* This is a question which has been hotly disputed for years. The controversy still goes on. One set of workers believe that tubercle bacilli from a distant focus such as the lung can be excreted by a healthy kidney; others, this year the majority (J. C. McClelland²⁷), regard the tuberculous bacilluria as due to a preclinical tuberculous lesion in the kidney.

Another equally uncertain question, and one which is intimately bound up with the foregoing, is: *Can a tuberculous kidney lesion heal?* Tuberculous lesions heal in other organs, and there is no good reason why they should not do so in the kidney. As T. E. Hammond²⁸ remarks, scars are by no means uncommon in the kidney; were they present in the lung, they would be regarded as healed tuberculous lesions.

With so much uncertainty regarding what are, at first sight, fundamental questions, the practitioner might easily feel justified in temporizing in cases of renal tuberculosis. It is therefore essential to prove to him the importance of: (1) Diagnosing accurately renal tuberculosis as early as possible; and (2) Advising surgical treatment without undue delay.

First let us see why the controversies referred to above hardly concern us. (1) Tuberculous bacilluria *per se* is unimportant, but *pus as well as tubercle bacilli* in the urine spells urinary tuberculosis. (2) Patients naturally do not present themselves for treatment until symptoms have appeared. The earliest symptoms are bladder symptoms, notably increased frequency. By the time bladder symptoms have appeared there is no authentic case where the causative kidney lesion has healed. Therefore, from the standpoint of the practitioner, the thing to concentrate upon is what R. V. Day²⁹ happily terms "*clinically established renal tuberculosis*".

D. W. Mackenzie³⁰ lays stress on the following symptoms of unilateral renal tuberculosis, symptoms which call for a complete urological investigation: (1) Frequency is usually the first symptom noted, and frequency in a patient between 20 and 40 should arouse suspicion; (2) Dysuria, especially if associated with frequency; (3) Pyuria is almost a constant finding, the reaction of the urine being usually acid; (4) Hematuria is comparatively rare.

R. B. Henline³¹ gives a very useful tabulation of the predominating symptoms. The high incidence of fixed renal pain is especially instructive.

Frequency ..	..	85	per cent of cases
Fixed renal pain ..	..	76	" " "
Pyuria ..	..	50	" " "
Hæmaturia ..	..	35	" " "

Henline warns us that there are periods of temporary regression of the bladder symptoms, and palliative treatment, which has usually been instituted, receives undeserved credit. In fully 20 per cent of cases there is a lead that the patient is tuberculous. A careful history, particularly the family history, and a complete general physical examination are never superfluous. Several authors refer to a tell-tale hard nodule in the epididymis which has been overlooked at the clinical examination.

Examining the Urine for Tubercle Bacilli.—When renal tuberculosis is suspected but tubercle bacilli cannot be demonstrated in the catheter specimen, H. Moore³² instructs the patient to bring a twenty-four-hour specimen and then examines the sediment. Recent improvements in bacteriological technique have made it relatively easy to cultivate tubercle bacilli.³³ The culture medium which has made the growth practicable is Saenz's modification of the

Petragnani medium. Compared with staining methods culture method is slow, but it is cheaper and more rapid than animal inoculation (D. N. Eisendrath³⁴). A good growth of tubercle bacilli is generally to be obtained in three or four weeks (C. Dukes³⁵, L. R. Seidman³⁶).

In most cases of renal tuberculosis the tubercle bacilli are found in the urine easily. In other cases (15 per cent according to Eisendrath), even after a repeated and careful search, they are difficult to find. In a few examples tubercle bacilli are definitely entirely absent. In his study of tuberculous kidneys after removal Cuthbert Dukes shows that the presence of tubercle bacilli in the urine depends on the situation of the lesion and its relation to the renal pelvis rather than on the stage of the disease. Dukes examines his material in the following manner. Soon after excision the kidney pelvis is distended with 10 per cent formal solution; after three days the specimen is examined. In addition to the routine scrutiny of the interior of the kidney, each calix is opened with a pair of small scissors. Using this refined pathological technique he proved that in those cases where tubercle bacilli are present in the urine the tuberculous lesions always communicate with the renal pelvis. An early tuberculous ulcer at the apex of the papilla may be overlooked unless the kidney is examined in this way. When the bacilli are not to be found in the urine either the lesion is embedded in the kidney substance or the renal pelvis is the seat of dense fibrosis.

Plain X-ray Examination.—C. A. Waters³⁷ finds that in about 40 per cent of cases of renal tuberculosis tuberculous calcification is sufficiently in evidence to cast a shadow.

Pyelography.—*Excretion pyelography* has proved of great assistance in the early diagnosis of renal tuberculosis. It is not only helpful in outlining the kidney pelves, but it gives fundamental information regarding the function of both kidneys. Unfortunately, it fails to outline minor deformities in the early stages of the disease. C. A. Waters says that as far as the diagnosis of early renal tuberculosis is concerned excretion pyelography has not so far yielded the brilliant results hoped for. E. Papin³⁸ comments on the great value intravenous pyelography has been to him in these cases. It is indispensable when catheterization of the ureters is impossible, and it has displaced entirely the need for an exploratory operation.

Instrumental pyelography is still essential in visualizing less obvious, and consequently early, lesions (*Plate XXXIV*). In early cases the calices are buried and have a fuzzy or moth-eaten appearance (D. W. Mackenzie). E. Simon³⁹ states emphatically that there is no danger of carrying bacilli to the sound kidney by ureteric catheterization. H. Wade⁴⁰ also shares this view, but other authors consider that this untoward possibility exists. It is therefore advisable, when possible, to employ instrumental pyelography on the side of the lesion only. Caution must be taken not to over-distend the renal pelvis with the visualizing medium for fear of disseminating the causal virus from the diseased kidney into the venous system (A. Jacobs⁴¹).

Cystoscopy.—The appearance of the bladder on cystoscopic examination often makes the diagnosis of renal tuberculosis possible even in the absence of finding the causal organism. The first point usually noted is a reduced capacity of the bladder, which is normally 8 to 12 oz. (A. Jacobs). H. Wade has found that in 95 per cent of his cases of urinary tuberculosis the bladder is smaller than usual. In addition to smallness of the bladder, the mucosa is often abnormally red (H. Moore). The diminished capacity of the bladder is sometimes evident before the signs of alterations in the ureteric orifice of the affected side are manifest. One of the earliest signs is oedema of a ureteric orifice. Later it becomes red and congested and appears like a local von

PLATE XXXIV

RENAL TUBERCULOSIS

(R. B. HENLINE)



Early tuberculosis of the right upper calix: instrumental pyelogram.

By kind permission of 'Surgery, Gynecology and Obstetrics'

Pirquet's reaction (H. Wade). In more advanced cases the golf-hole ureteric orifice of Penwick is characteristic. When tuberculous cystitis is present it is usually more pronounced in the vicinity of the outflow from the diseased kidney, but this is not constant.

Prognosis.—Without operation the mortality within five years among patients with unilateral renal tuberculosis is, according to Person (quoted by Jacobs), 82.5 per cent. In about 20 per cent of cases death is due to tuberculous meningitis. The operative mortality is 3 to 5 per cent (V. Blum⁴²). Sixty per cent of patients with unilateral renal tuberculosis on whom nephrectomy was performed were alive and well more than ten years after the operation (Jacobs, quoting Wildbolz).

The Importance of Post-operative Treatment.—While the benefits of timely surgery in unilateral renal tuberculosis are inestimable, the importance of post-operative medical treatment is emphasized by all authors. In many instances a period of strict sanatorium régime is advised.

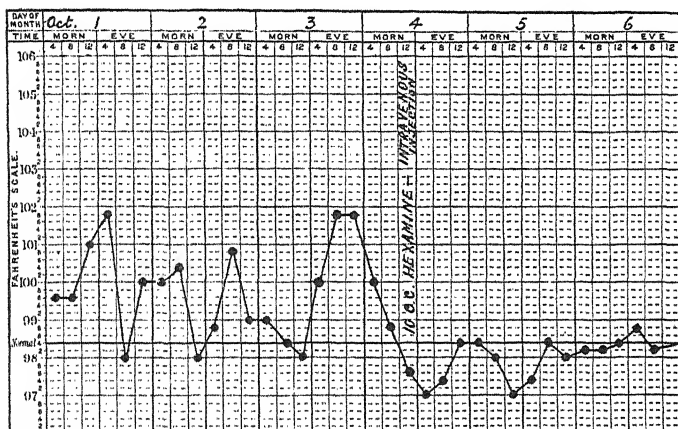


Fig. 36. Temperature chart showing the dramatic effect of an injection of intravenous urotropine in a case of acute pyelitis.

Breaking-down of the Lumbar Wound.—A frequent cause of dissatisfaction after nephrectomy for renal tuberculosis is breaking-down of the wound and the development of sinuses. Even when the wound heals by first intention sinuses sometimes occur weeks or even months later. This type of complication occurs in about 30 per cent of cases. A certain number of these are due to infection from the stump of the ureter, and on this account complete excision of the affected ureter as well as the diseased kidney is recommended and practised by some surgeons. Infected perinephric fat has also been held responsible, and it has been advised to dissect completely the fatty envelope at the time of the nephrectomy. Even with these precautions, sinuses are prone to develop, and they appear to originate in a new tuberculous process in the traumatized tissues.

G. J. Thomas and T. J. Kinsella⁴³ advise the following programme for this troublesome complication. First the patient's general condition is improved by general treatment and heliotherapy. Second, if under the régime the sinuses do not heal they are visualized by the injection of opaque fluid to

determine their size, direction, and extent. Third, the nephrectomy incision is re-opened and the sinuses and their surrounding tissue are excised with the diathermy knife and any residual infected tissue is destroyed by diathermy. Sometimes the wound can be closed, sometimes it is packed. Heliotherapy plays an important part in treatment after excision of the sinuses.

Bilateral Renal Tuberculosis.—Renal tuberculosis is clinically bilateral in at least 30 per cent of cases (A. Jacobs). After making a diagnosis of bilateral renal tuberculosis most surgeons relegate the patient to a miserable existence, and, as statistics show, to almost certain death in a short time. R. B. Henline believes that if a destructive lesion is proved in one kidney and the functional tests of the other are satisfactory, the kidney containing the major lesions should be removed. This, combined with appropriate post-operative medical treatment, gives the patient the best chance of prolonging his life in comfort. (See also BLADDER, SURGERY OF.)

Acute Pyelitis.—The dramatic control of severe acute pyelitis by the injection of intravenous *urotropine* (Schering) has been noted many times by the reviewer. The temperature chart shown in *Fig. 36* illustrates an especially

instructive instance, for the patient, in spite of treatment with alkalis and urinary antiseptics, continued to manifest severe symptoms for a fortnight. One injection of intravenous urotropine had the extremely satisfactory effect shown in the chart. Curiously, this form of therapy appears to be without value in chronic cases.

Perinephric Abscess.—The common sources of perinephric abscesses are analysed by H. C. Rolnick⁴⁴ and are represented diagrammatically in *Fig. 37*.

V. Vermooten⁴⁵ finds that those abscesses which originate in the kidney and form perinephric abscesses do not often respond to simple incision and drainage. It is this type which gives rise to a persistent sinus.

Pyonephrosis.—R. Gutierrez⁴⁶ praises a two-stage operation for pyonephrosis. At the first stage nephrostomy is performed, and at the second the kidney is removed. [The author does not, however, dwell upon the difficulties of the second stage of the operation, which is often complicated by massive adhesions.—H.B.]

R. W. Barnes⁴⁷ details a case of a pyonephrosis which ruptured into the ascending colon. While the patient was receiving chiropractic adjustment for persistent pain in the back her symptoms suddenly became less, and soon afterwards she passed a watery stool containing blood and pus. Unfortunately,

the symptoms soon returned, and pyelography showed a renocolic fistula. Nephrectomy, with closure of the opening into the colon, proved successful.

Malignant Kidney.—The term 'hypernephroma' (Grawitz tumour) implies an origin from the adrenal, but this conception is far from proved. It is best to regard these tumours as renal carcinomata. The other type of malignant growth of the kidney is the embryoma or Wilms' tumour. The latter growth usually appears in early childhood and may be bilateral. Some consider that all malignant growths of the kidney can be placed in one or other of the above categories (F. H. Scotson⁴⁸).

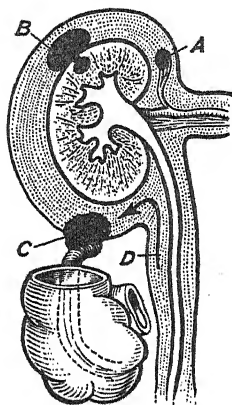
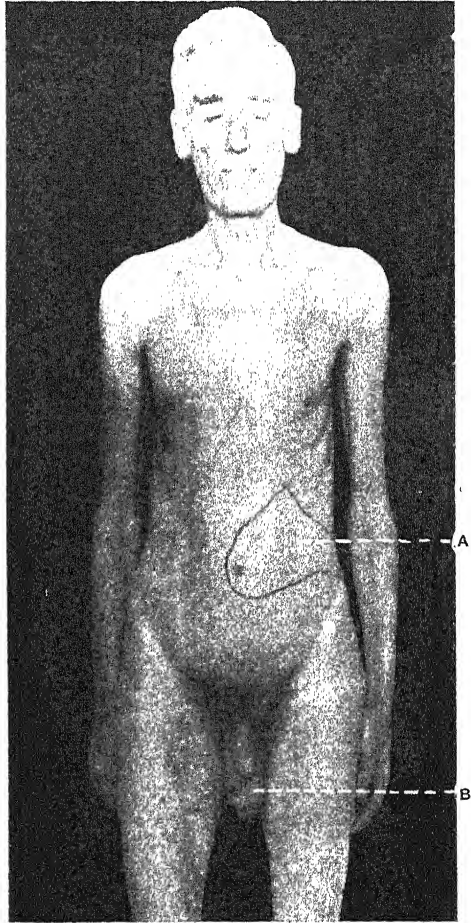


Fig. 37.—Common sources of perinephric abscess. *A*, Hematogenous form from a distal focus; *B*, Extension of a cortical abscess in the perinephric fat; *C*, Retrocecal appendix abscess extending into the perinephric space; *D*, Extension of infection from the prostate, etc., along the perireticular lymphatics. (After Rolnick.)

PLATE XXXV

GRAWITZ TUMOUR WITH SECONDARY VARICOCELE

(HAMILTON FAIRLEY)



Secondary varicocele (B) associated with a Grawitz tumour (A). After the kidney had been removed the varicocele disappeared within three weeks.

K. Fischer,⁴⁰ reporting a series of cases of Grawitz tumour from the Rubritius Clinic, Vienna, draws attention to the fact that in more than half the cases the only symptom was painless hæmaturia. If only nephrectomy can be performed early enough, the prognosis in this type of growth is good, patients having been traced alive and well up to twelve years after operation.

An interesting occasional physical sign in cases of renal neoplasm in the male is the onset of a varicocele. Plate XXXV shows such a case. After the kidney tumour had been removed the varicocele disappeared within three weeks. Grawitz tumours are notorious for giving rise to secondary deposits in bone. Sometimes the patient presents himself with the (secondary) bone lesion before the primary tumour is manifest. It is helpful to refer to the diagram of Schinz and Uehlinger⁵⁰ (Fig. 38), founded upon a detailed study, which shows the sites of election of the first bony metastasis. Later, almost any bone can be invaded, the vertebræ being particularly attacked. G. Simpson⁵¹ calls attention to the frequency of bony metastases in cases of renal carcinomata. In his present study he is referring particularly to indisputable carcinoma as opposed to Grawitz tumours. In this type of growth secondary deposits occur early and regularly in the lumbar vertebræ, usually before a renal tumour is palpable. X-ray shows collapse of one or more vertebræ; pain in the back is agonizing and unrelieved by sedatives. As the end draws near paraplegia develops.

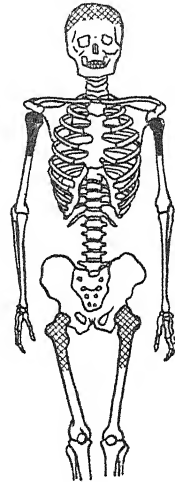


Fig. 38.—Sites for solitary bone metastases from hypernephroma. The black area shows the most common sites; the shaded area, the less common sites. (After Schinz and Uehlinger.)

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LABOUR AND ITS COMPLICATIONS.

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

Relief of Pain during Labour.—The alleviation of pain during childbirth by means which do not involve any additional risk to mother and child is a subject which continues to receive attention both at the hands of medical and lay

writers. The matter has recently received a fresh impetus by the action of the Council of the British College of Obstetricians and Gynaecologists in initiating a detailed investigation into the potentialities of certain selected anæsthetic and analgesic substances at various maternity hospitals and clinics. The results of this inquiry will be awaited with interest. Meanwhile a valuable report has been published by Louise McIlroy and Helen Rodway¹ upon the means adopted to relieve pain in 560 cases of spontaneous labour at the Royal Free Hospital. These authors point out that a completely painless labour due to the administration of an analgesic or anæsthetic is rarely possible without some degree of danger. The ideal drug for use during the first stage of labour should not have any inhibitory effect upon uterine contractions, nor should it increase the risk of post-partum hæmorrhage at the end of the second stage. It should possess analgesic and amnesic properties which have no adverse effect upon the fœtus, and during the second stage it should not prevent the patient from co-operating in an intelligent manner with her medical attendant. A condition of analgesia should be maintained if possible until the head is about to be delivered, when anaesthesia is usually necessary.

Amongst the various drugs investigated it was found that a combination of *potassium bromide* and *chloral hydrate* is a useful and safe sedative in the first stage, especially in excitable and nervous patients, and it has no apparent effect in lessening uterine contractions: 30 gr. of each drug as an initial dose, repeated in smaller doses at three- or four-hourly intervals, appears to give good results. Vomiting is avoided by sipping the mixture dissolved in at least six ounces of water with glucose and lemon juice. *Morphine* is regarded by the authors as the most valuable of all sedatives, and they consider it much safer than many of the toxic barbiturates now in use. Its effect is prolonged and intensified by administration in a 50 per cent solution of magnesium sulphate. *Opioidine*, which contains in addition to morphine other alkaloids of opium, is regarded as preferable to morphine and is the preparation most generally used at the Royal Free Hospital. It may be administered orally in tablet form or by injection in a dose of $\frac{1}{3}$ gr. McIlroy and Rodway advise that the injection of morphine or opioidine be supplemented by 2 c.c. of a 50 per cent solution of *magnesium sulphate* given intramuscularly and repeated two-hourly for two succeeding doses according to Gwathmey's technique. The administration of morphia should be withheld until the cervix will admit three fingers or until the patient is not helped by potassium bromide and chloral hydrate. Opioidine in tablet form may be commenced earlier in labour with or without potassium bromide and chloral, since its action by this method is delayed. The advantage of combining morphia with a 50 per cent solution of magnesium sulphate is to intensify and prolong its action. The effect upon uterine action is apparently but slight. In many cases no alteration in the frequency or duration of uterine contractions was noticeable, but in some the intervals were prolonged although the actual 'pains' were increased in intensity. In the case of the infants spontaneous respiration took place no matter how late the administration of the drug. This is interesting in view of the influence of both morphia and magnesium sulphate upon the respiratory centres. Should breathing be sluggish, the authors strongly advocate resuscitation by means of carbon dioxide and oxygen instead of the old methods of artificial respiration, which they regard as dangerous.

During the second stage of labour *nitrous oxide gas and oxygen*, administered by means of either Boyle's or McKesson's portable apparatus, appear to give the best results. The duration, strength, and frequency of the uterine contractions increased rather than diminished in over 50 per cent of the cases investigated,

and no instance of post-partum haemorrhage due to the administration of anæsthetic drugs occurred in the whole series. The proportions of gases used which appeared to give ideal results were nitrous oxide 80 per cent and oxygen 20 per cent. The mixture may be varied according to the needs of the patient, and if co-operation is not good, the percentage of oxygen is increased. The administration of the anæsthetic is continued for half to three-quarters of a minute after each pain has ceased.

During birth of the head *chloroform* should be added, and is the anæsthetic of choice. It should be regarded, however, as an adjunct to nitrous oxide and oxygen and only used in sufficient quantity to relieve pain at the most acute stage. Prolonged anæsthesia with chloroform results in delay in the establishment of respiration on the part of the child. *Ether* administration during the second stage of labour is associated in many cases with a marked depressing effect on uterine activity, except when the minimum is employed for delivery of the head.

It will be interesting to note whether these observations are confirmed as a result of the wider investigation now being undertaken. There appears to be little doubt that the problem of a comparatively painless and yet safe labour is capable of solution in the majority of cases. At the same time it is evident that the attainment of ideal results demands the constant presence and supervision of an attendant who possesses the requisite knowledge of the analgesic and anæsthetic drugs involved and the necessary skill for their administration in individual cases.

Dry Labour.—The term 'dry labour' has perhaps a different significance to the patient, the midwife, and the obstetrician. On more than one occasion we have heard the term used by a woman when her labour has been prolonged by causes other than those related to the bag of membranes. Midwives, on the other hand, commonly refer to a labour as being 'dry' when the first stage is prolonged as a result of dilatation of the cervix by the presenting part, even though the bag of membranes may be intact. Some obstetricians employ the word under similar circumstances, but the majority visualize a labour complicated by premature rupture of the membranes. A. H. M. J. van Rooy,² in a recent communication, draws attention to the lack of unanimity in nomenclature even amongst scientific investigators. Some speak of dry labour when, uterine contractions having commenced normally, the membranes rupture when dilatation is only 2 or 3 cm. He prefers to limit the term strictly to those cases only in which the liquor amnii escapes spontaneously before labour has commenced. This event is generally looked upon as having an unfavourable influence on the further progress of labour, and at the present day when puncture of the membranes is advocated by some as a useful procedure in the technique of induction, the results of a dry labour to mother and child are not without interest.

In the space of ten years (1921-31) 15,843 women received obstetrical aid in the Clinic of the University of Amsterdam. During this period the incidence of premature rupture of the membranes was 0·82 per cent in primiparæ and 1·25 per cent in multiparæ. If, however, those cases are included where rupture occurred after the onset of labour but before dilatation of the cervix to 3 or 4 cm., the frequency of 'dry labour' is materially increased and reaches the figure of 9·39 per cent. Van Rooy, for purposes of comparison, divides his cases into two groups, A and B, Group A including cases of premature rupture of the membranes in the strict sense, and Group B those where rupture occurred after labour had commenced but before dilatation was complete. The average duration of labour in Group A was 21 hours 4 minutes in primiparæ and 11 hours 43 minutes in multiparæ. In Group B labour occupied an average

of 21 hours 55 minutes in primiparae and 15 hours 33 minutes in multiparae. The duration of labour is therefore prolonged, especially in primiparae, by premature rupture of the membranes. Further, in Group A 16.99 per cent of the cases, and in Group B 15.75, required artificial aid, an observation which coincides with the experience of other obstetricians. It should be noted, however, that the indication for interference in Van Rooy's series was constituted in fully 50 per cent of the cases by pelvic contraction, a complication which in itself was probably responsible for premature rupture of the membranes.

The foetal mortality in both groups is dependent largely upon the necessity or otherwise for artificial aid. In the case of Group A it reached the high figure of 25.71 per cent as against 2.34 per cent when the labour ended spontaneously. In Group B also the same marked difference is notable, the figures quoted being 21.05 per cent as contrasted with 4.26 per cent.

It is interesting to note that amongst 929 mothers only one death occurred, the result of post-partum haemorrhage from uterine atony. The maternal morbidity, based upon the occurrence of a temperature above 100.4° on more than one occasion, reached 9.95 per cent in the case of spontaneous delivery and 28.56 per cent when labour required artificial termination.

The author concludes that the results following artificial aid, both as regards mother and child, compel one to the conclusion that in cases of 'dry labour' the standpoint of expectancy should be adopted whenever possible. Premature interference cannot but endanger the chances of survival of the child and favour morbidity of the mother.

Obstetric Shock.—In a discussion upon the ketone content of the blood in labour, D. F. Anderson³ observes that there appears to be an intimate relation between the condition of obstetric shock and a state of *ketosis*. In the course of an ordinary labour with the patient on a restricted diet it is frequently noticed that intensity of the reaction for ketonuria becomes progressively more marked as the time for delivery approaches, and Anderson points out that signs of maternal and foetal distress apparently coincide with an increased ketone content of the urine. Under normal conditions acetone and diacetic acid occur in the blood rarely in greater concentration than 1 mgrm. per 100 c.c. After difficult or prolonged labour, e.g., occipito-posterior presentation or forceps delivery, the author found that the blood withdrawn immediately after labour contained these substances in varying amounts as high as 3.2 mgrm. per 100 c.c. When obstetric shock is imminent it would appear probable that these figures may be considerably augmented. It is now generally accepted that during surgical shock there is a large output of acid waste products from the body, and Almroth Wright and Colebrook⁴ have shown that, in spite of this increased acid content, the alkalinity of the blood is maintained. Muscular exertion and fatigue, such as occurs in prolonged labour, and tissue trauma, especially contusions produced during obstetric manipulations and forceps deliveries, result in the production and absorption of dangerous quantities of *histamine* and the risk of serious shock. With a long labour and its implication of a greater tendency to ketosis the danger of obstetric shock increases. As it is in precisely this type of case that anaesthesia is necessary, the choice of anaesthetic is a matter of the greatest importance. Anderson points out that *chloroform* and *ether* administered for even a short time are liable to render the degree of acidosis more pronounced and the supervention of obstetric shock more imminent.

In an Arris and Gale Lecture R. J. S. McDowall⁵ refers to the same matter, and states that from experimental evidence it seems certain that ether and probably other anaesthetics sometimes make recovery from the histamine bodies impossible when it might have taken place in the absence of the anaesthetic.

Ether is particularly dangerous in that whilst dilating the blood-vessels and rendering them more permeable, its action is masked at the time of operation by virtue of its stimulating properties. *Nitrous oxide* apparently does not increase the susceptibility of an animal to histamine shock, and therefore is the only anæsthetic which is permissible in the case of a woman exhausted by a long labour and in whom a marked degree of ketosis exists.

An observation by E. Lévy-Solal⁶ is also of considerable practical importance in the prevention of shock after labour. This author states that during parturition, the blood-sugar, which gradually rises during the ninth month, increases still more rapidly, to be followed by a fall after delivery. If this fall is too rapid, symptoms of shock appear. As a prophylactic measure Lévy-Solal emphasizes the importance of administration of *glucose* to women during labour. Anderson refers to the same matter, and pleads for the more generous treatment of women in labour as regards *diet*. He points out that man undergoing severe muscular exercise requires and receives adequate nourishment, whilst woman, at the time of her greatest muscular effort, is denied a bare sufficiency! Ordinary meals are of course impossible, but starvation acidosis may be guarded against by the liberal administration of carbohydrate conveniently given in the form of *barley-sugar*.

Post-partum Hæmorrhage.—The etiology and treatment of post-partum bleeding has always occupied an important place in obstetric literature, and each year sees the appearance of one or more articles dealing with some aspect of the subject. C. H. Peckham and K. Kuder⁷ have recently analysed the whole of the clinical material available at the Johns Hopkins Hospital over a period of thirty-five years with special reference to the incidence of abnormal bleeding during the third stage of labour. From 1897, when the Department of Obstetrics was established at the Johns Hopkins Hospital, to the end of 1931, 19,290 women were delivered, and in this series there were 1185 cases of excessive post-partum hæmorrhage, an incidence of 6.14 per cent, or 1 in 16.3 cases. Pathological bleeding was based upon a loss of 600 c.c. or more.

An interesting observation is that hæmorrhage was relatively more frequent in white than in coloured women. Further, it is rather surprising to note that it occurred oftener amongst primiparæ than multiparæ in spite of the fact that four-fifths of the cases were directly the result of uterine atony, a condition which, as the authors observe, might be expected to be more common in the multiparous than the primiparous patient. The influence of operative as against spontaneous delivery is clearly shown by the fact of the higher incidence of bleeding associated with forceps operations, podalic version, etc. Thus podalic version and destructive operations were followed by post-partum hæmorrhage in 13.02 and 9.18 per cent of the cases respectively, as compared with a figure of 5.99 per cent when delivery was spontaneous. The total mortality was 0.104 per cent, which is reduced to a rate of 0.057 if contributory complications, e.g., eclampsia, nephritis, embolism, are eliminated and only deaths directly due to hæmorrhage are included.

PREDISPOSING CAUSES.—In an attempt to ascertain what factors, if any, predispose a patient toward serious bleeding Peckham and Kuder investigated the effects of age, duration of labour, distension of the uterus, and so forth. The results of this analysis are shown in the subjoined table.

It will be noted that three factors appear definitely to predispose a patient to excessive bleeding after delivery. These are: (1) *Prolonged labour*, especially increased duration of the third stage; (2) *Over-distension of the uterus* by a large child, multiple pregnancy, or hydramnios; (3) Increased *placental weight* and extensive *placental attachment*.

The actual cause of excessive bleeding in four-fifths of all cases appears to

be *uterine atony*. The remaining fifth is constituted by *lacerations of the birth canal* and *incomplete placental separation*. The authors observe that in 32 cases the hæmorrhage coincided with placental expulsion and was evidence of improper management of the third stage of labour. In this sense probably all of these cases were preventable. In 25 women dangerous post-partum bleeding complicated placenta prævia or premature separation of the placenta, a fact which should serve as a warning that bleeding after delivery is likely to occur and be of grave import in a patient already exsanguinated.

A STUDY OF VARIOUS FACTORS WHICH MIGHT PREDISPOSE TO POST-PARTUM HÆMORRHAGE (*Peckham and Kuder*).

FACTORS	CASES OF POST-PARTUM HÆMORRHAGE	GENERAL CLINIC POPULATION
1. Age of patient	23.68 yr.	23.80 yr.
2. Duration of labour, para 0	18.23 hr.	17.13 hr.
Duration of labour, para x	12.02 hr.	11.50 hr.
3. Duration third stage of labour	15.88 min.	13.09 min.
4. Multiple pregnancy	2.19 per cent of cases ..	1.15 per cent of cases
5. Toxæmia	8.69 per cent of cases ..	9.99 per cent of cases
6. Weight of child, white	3509.17 grm.	3390.70 grm.
Weight of child, coloured	3292.67 grm.	3165.37 grm.
7. Weight of placenta ..	644.45 grm.	598.67 grm.
8. Hydramnios	1.26 per cent of cases	
9. Myomas	0.51 per cent of cases	
10. Cervical tears	7.26 per cent of cases	
11. Perineal tears	52.91 per cent of cases	
12. Weight of patient after delivery ..	131.47 lb.	

A fact which does not appear to be sufficiently well recognized and which is clearly demonstrated by the figures of Peckham and Kuder is the increased risk of *puerperal sepsis* which is associated with excessive bleeding during or after labour. In a patient already anæmic from constitutional causes or causes incidental to pregnancy this potential risk of infection is naturally much increased. The authors record a 'morbidity' pyrexia of 100.4° or above on two or more days in the puerperium in 24.46 per cent of the post-partum hæmorrhage cases delivered spontaneously, and 39.62 per cent in patients submitted to operative measures. These figures should be compared with a standard of 17.10 per cent, which represents the incidence of puerperal infection including both spontaneous and operative cases of the entire clinic.

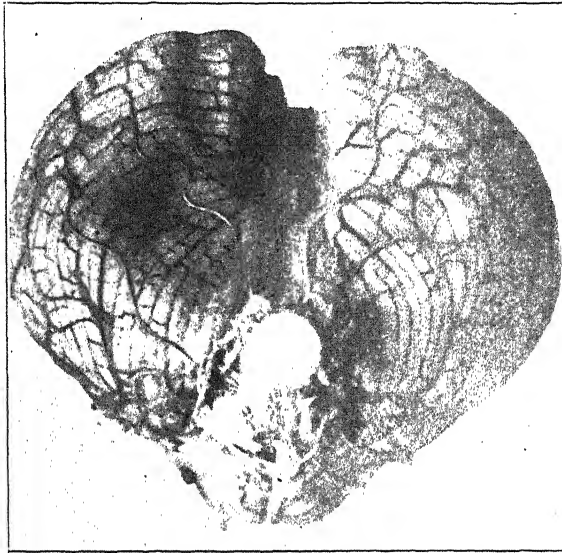
TREATMENT.—Post-partum hæmorrhage is best prevented by *proper management of the third stage of labour*. No attempt should be made to expel the placenta until it is completely separated unless urgent indications exist to the contrary. Its separation should be left entirely to nature; this in some cases occupies an hour, and occasionally longer. If, however, bleeding occurs before full separation of the placenta, Credé's method of expression should immediately be adopted. Only when this fails and bleeding is in progress is manual removal of the organ justifiable.

After all operative deliveries the cervix should be inspected, and, if a laceration is present, immediate suture will assist in decreasing hæmorrhage from this cause. Should it be impossible to apply efficient sutures owing to an

PLATE XXXVI

BIRTH INJURY OF THE OCCIPITAL BONE

(F. A. HEMSATH)



Inferior surface of cerebellum showing the depression caused by the displaced inferior portion of the squama occipitalis. Untouched photograph.

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'American Journal of Obstetrics and Gynecology'*

cedematous and softened condition of the tissues, resort must be made to a firm and carefully applied vaginal pack.

In cases of atony of the uterus where massage, bimanual compression, and the hypodermic use of pituitary and ergot preparations are of no avail, Peckham and Kuder state that excellent results may be obtained by the *intravenous injection* of $\frac{1}{2}$ c.c. of *pituitrin* slightly diluted in normal saline solution, as recommended by Hofbauer. In similar circumstances the reviewer has employed with good effect the injection of 1 c.c. of *pitocin* directly into the uterine wall, at a point on the abdominal parietes 1 in. below the umbilicus, in the mid-line.

At the Johns Hopkins Obstetrical Clinic *tamponade of the uterus* is also regarded as a valuable weapon in cases of stubborn uterine atony. The pack is moistened with 70 per cent alcohol and tightly inserted into the uterine cavity by means of a Holmes packer, an instrument which makes the operation simple, rapid in execution, and more aseptic in technique. When the bleeding is controlled, the administration of *intravenous glucose* or *blood transfusion* will hasten recovery during the puerperium, and diminish the risk of puerperal infection. The latter danger may, in the reviewer's opinion, be further eliminated by the prophylactic use of *anti-streptococcal* or *anti-scarlet fever antitoxin* administered intramuscularly at the end of labour.

Birth Injury of the Occipital Bone.—Sixty years ago K. L. E. Schroeder⁸ described three cases of injury to the occipital bone resulting from forceps applied to the foetal skull during the process of birth. That the lesion is more common than is generally supposed is shown by F. A. Hemsath,⁹ who describes 31 cases from a series of 166 consecutive autopsies on still-births and neonatal deaths during a period of two years at the New York Lying-in Hospital.

At birth the occipital bone is composed of four segments, the squamous, two lateral, and the basilar portions, separated by cartilage joining the anterior and posterior intra-occipital synchondroses. Although the latter normally permit a hinge-like motion of the squamous portion of the bone during labour, this point is nevertheless very vulnerable during labour. Excessive pressure exerted on the suboccipito-bregmatic diameter may cause excessive over-riding of the bones, with the result that the dura mater is stripped from the lateral portions. The capacity of the posterior skull fossa is decreased, and in some cases a transverse ridge is produced across the floor of the fossa which results in a corresponding depression on the inferior surface of the cerebellum (*Plate XXXVI*). The injury is particularly dangerous in view of the relation of the point of pressure to the respiratory centre in the medulla oblongata. Furthermore, circulation is obstructed in the occipital sinus and the inferior cerebellar veins, which may lead to rupture and extravasation of blood in the sub-tentorial region.

The lesion, which is termed by Hemsath '*occipital osteo-diastasis*', is favoured by manual traction applied to the occiput and chin during the delivery of impacted shoulders. It may also occur during delivery of the head in breech extraction and occasionally from misapplied force during forceps operations.

Amongst the writer's 32 cases were 12 cases of contracted pelvis and 7 in which the foetus weighed 9 lb. or more. The influence of disproportion as a contributory cause is therefore quite evident. Recognition of the possibility of the injury and the mechanism of its production should result in a diminution of the incidence of this cause of still-birth. From a consideration of the factors involved Hemsath suggests the following points to prevent occipital osteo-diastasis: (1) During forceps delivery careful cephalic application is essential, and the direction of traction should not force the occiput directly against the symphysis; (2) During delay of the after-coming head in breech labours, the

occiput should be protected at the symphysis by attention to the direction and force of the traction; (3) Manual traction on the head for delivery of the shoulders should be applied to the sides of the head, and pressure upon the occiput must be avoided.

REFERENCES.—¹*Jour. Obst. and Gynecol. Brit. Emp.* 1933, xl, No. 7, 1175; ²*Ibid.* No. 5, 850; ³*Ibid.* 1934, xli, No. 2, 261; ⁴*Lancet*, 1918, i, 763; ⁵*Ibid.* 1933, i, 480; ⁶*Presse méd.* 1932, xl, 1853; ⁷*Amer. Jour. Obst. and Gynecol.* 1933, xxvi, Sept., 361; ⁸*Lehrbuch der Geburtshilfe*, 1871, 2nd ed., 453, Bonn, Max Cohen & Sohn; ⁹*Amer. Jour. Obst. and Gynecol.* 1934, xxvii, Feb., 194.

LARYNX, AFFECTIONS OF.

F. W. Watkyn-Thomas, F.R.C.S.

TUBERCULOSIS OF THE LARYNX.

Division of the Superior Laryngeal Nerve.—Anton Sattler¹ has carried out this operation in a series of 20 selected cases of advanced laryngeal tuberculosis. He has done this because he regards the relief obtained by alcohol injections as uncertain and transient. In 6 cases the nerve was divided on both sides. If this is done there should be an interval of a fortnight between the division of the first and the second side in order to accustom the patient gradually to the loss of sensation about the glottis. This precaution may not entirely prevent discomfort and difficulty in swallowing for the first few days, but usually there is remarkably little trouble. The operation is done under local anaesthesia. An incision along the anterior border of the sternomastoid is carried down to the carotid sheath, and the external carotid is drawn outwards. The internal branch of the superior laryngeal is found running down and forwards behind the external carotid and is traced to the posterior border of the thyro-hyoid muscle, under which it passes before dividing into the terminal branches which pierce the membrane. After division a portion of the peripheral stump is resected. It is, of course, essential to exclude the presence of pharyngeal ulceration before embarking on the operation.

Galvanocautery.—O. Gianni and C. Dall'Olio,² discussing treatment of tuberculous lesions of the larynx by galvanocautery, state indications far wider than are generally accepted. They regard perichondritis and dyspnoea, so severe that tracheotomy has to be considered, as the only real contra-indications, but they do not advise the use of the galvanocautery where there is subglottic infiltration. They use a fine needle for puncture, and a flat end for surface destruction over ulcerated areas. Puncture only is used about the arytenoids, surface destruction on the ventricular bands with puncture on the outer parts, and puncture by a special point within the ventricles. For infiltration of the epiglottis they puncture; for ulceration they use surface-destruction. They believe that there is no risk from haemorrhage except in the posterior part of the band. Reactionary oedema is rare, except in the subglottic space. They have, however, had some cases in which the subsequent stenosis was severe enough to cause dyspnoea.

Alcohol Injection of the Recurrent Laryngeal Nerve.—P. Vernieuwe³ remarks that although immobilization of a tuberculous lung by phrenectomy or artificial pneumothorax is a well-established method of treatment, little has been done to apply the same principles to the larynx beyond the necessarily imperfect rest afforded by silence. Attempts have been made to immobilize the larynx by tracheotomy and so to aid the cicatrization of the lesion, but the number of successful cases has been too small to be encouraging, and except in cases of actual stenosis, the method has been abandoned.

In one case he has immobilized one side of the larynx by alcohol injection of the recurrent laryngeal nerve. The patient was a woman of 25 with dysphonia and hoarseness, pain reaching the ear, and severe dysphagia. There

was oedema and ulceration limited to the left cord. There was no spread into the arytenoid region.

Under local anaesthesia the carotid sheath was exposed, and the vessels and vagus were drawn outwards. The inferior thyroid artery was divided and the left recurrent laryngeal nerve was exposed, lying on the oesophagus in the groove between the oesophagus and the trachea. The nerve was easily recognized by its position and by the anastomotic branches to the sympathetic plexus behind the vessels. The nerve was then isolated and one drop of alcohol was injected into the sheath. The wound was sutured in layers and closed without drainage. There was immediate paralysis of the left cord in the paramedian position. The paralysis remained for three months, and the voice then recovered completely. The ulcer was healed within three weeks of the operation.

Encouraging though this case has been, Vernieuwe points out that the indications for the operation are most strictly limited: (1) There must be a unilateral lesion; (2) There must not be any perichondritis; (3) There must be no interarytenoid disease, as this region would not be immobilized by the collapse of one cord; (4) There must already be hoarseness, or the operation will make phonation worse; (5) There must be dysphagia. The general condition of the patient is no contra-indication. In this case the patient was in a very poor state and the relief of pain and dysphagia greatly improved her.

Radiotherapy.—G. Ferreri⁴ believes that *ultra-violet light treatment* in tuberculous laryngitis is helpful, but nothing more. "Cure due exclusively to the action of ultra-violet rays is very rare, if not impossible."

X-ray treatment for laryngeal tuberculosis was first tried in 1898, and it has been shown by a series of biopsies that the treatment produces an intense new formation of fibrous tissue which can shut off and strangle the tuberculous lesion.

The great difficulty in applying the treatment has always been to define the precise indications. It is generally agreed that the catarrhal and non-ulcerated hypertrophic forms of the disease respond well to X rays, but there is absolute disagreement as to the utility, or even of the safety, of using X rays in the ulcerated and oedematous lesions. The general opinion in Denmark and Germany is strongly opposed to Roentgen therapy in this group. Ferreri admits that the best results are obtained in hypertrophic and infiltrating cases, but he lays stress on the hyperplastic reaction and the new formation of connective tissue produced by the rays, rather than on their destructive action, which he believes can be avoided by proper 'fractioning' of the dose.

The greater number of Ferreri's cases had infiltrating tuberculosis, usually limited to the cords or to the posterior part of the larynx, and it was with these patients that the best results were obtained. When ulceration was present cure could not be expected, but usually there was considerable relief of pain and dysphagia. In all, 25 patients were treated: 6 were cured, 12 improved, 3 remained unchanged, 2 got worse, and 2 died. In neither of the fatal cases was there any local aggravation; death was entirely due to the rapid advance of the lung condition.

CARCINOMA OF THE LARYNX.

Surgical Treatment.—Chevalier Jackson⁵ says of the curability of cancer of the larynx by *laryngofissure* that nowhere else in the body has there been obtained a higher percentage of cures of cancer than in the larynx, provided that we limit our statistics to the curable class of case, early intrinsic cancer. If a patient is free from cancer for five years after operation we are justified

in saying that he is cured. If cancer develops afterwards, even at or near the same place, it should be regarded as a new condition, not a recurrence. The cause of incurability is that only 19 per cent of patients come to the surgeon at the period when the disease is curable by laryngofissure. The patient takes it for granted that his hoarseness is due to laryngitis and will clear up; he has had real laryngitis before and it always has cleared up. In the larynx leukoplakia and "some forms of benign growths" should be regarded as precancerous conditions.

About 80 per cent of cases in which a cancer of small extent is limited to the intrinsic area of the larynx are curable by laryngofissure. The ideal case is one where a small growth lies on the free edge of the vocal cord. The elastic tissue of the cord is tendinous and has few vessels or lymph channels; the edges are covered with thin, firm epithelium without glands, not with true mucosa; all the lymph channels drain into one gland on each side, and this gland has no demonstrable efferent vessels.

Of 74 patients with cancer of the larynx suitable for laryngofissure operated on prior to five years ago, 55 were traced: 5 had died without recurrence of cancer in the larynx; 9 died of recurrence of laryngeal cancer; 41 were alive and well, for periods of from five to thirty-one years. In one case the growth was a sarcoma, in one an endothelioma, in one a basal-celled carcinoma; all the others had squamous-celled carcinoma, and all the cures were in this group. Jackson states his conclusions as follows:—

1. Early intrinsic cancer of the larynx is curable by laryngofissure in 82 per cent of the cases.

2. It is seen in this curable stage in only 19.3 per cent of the cases.

3. The chief cause of this deplorable fact is that the patient in the early stages thinks his hoarseness is due to laryngitis.

4. The pessimism of the laity as to the curability of cancer is based upon operations in late cases.

5. The laity should be taught two things, namely: (a) Hoarseness of more than two weeks' duration may be early curable cancer and the patient should present himself to his physician for a laryngeal examination; (b) The cure of cancer may be likened to putting out a fire. When the fire consists of the first flames of a few pieces of ignited paper it can be stamped out completely and permanently. When the fire has been allowed to run on until the whole building is aflame and the roof is falling any efforts to stop it are utterly hopeless.

G. B. New and J. M. Waugh⁶ comment on the good results obtained by surgical treatment of carcinoma of the larynx. They have studied the curability of the disease in 107 cases in which operation was performed at the Mayo Clinic prior to 1928. Only 8 per cent of the patients were women; the average age was 55, but three laryngectomies were performed on patients under 23. Carcinoma of the epiglottis is usually of low malignancy and can be removed by diathermy with suspension, after preliminary tracheotomy; pharyngotomy is only needed for advanced cases. *Thyrotomy* (laryngofissure) with or without removal of cartilage is indicated for early growths on the anterior two-thirds of the cord. If both cords are affected anteriorly, the whole area can be removed. *Laryngectomy* should be done for highly malignant growths unless excision can be wide enough to eliminate the possibility of spread by lymphatics. Pharyngotomy should be performed for advanced growths in the region of the epiglottis, the base of the tongue, the ary-epiglottic fold, and the posterio-cord region.

If the cervical lymphatic glands are involved and the growth is of low malignancy, a block dissection should be done. If the malignancy is of high grade, irradiation is valuable.

At the Mayo Clinic there have been 75 consecutive cases of laryngofissure with no operation death, and 60 consecutive laryngectomies with one fatality. On the 107 traced patients, in 34 laryngofissure was performed, and 28 were free from recurrence after five years; in 73 laryngectomy was done and 41 had five-year cures.

The grading of malignancy by histological appearances showed that 79 per cent of Grade II malignant growths were cured, and none of Grade IV.

The authors' conclusions are that: The surgical treatment of carcinoma of the larynx, compared to the treatment of carcinoma in general, entails a low operative mortality (less than 1 per cent), and a high percentage of five-year cures (64.5 per cent). Patients operated on for carcinoma of the larynx usually have a good outlook as regards speech. Almost all the patients who have had a conservative operation develop useful voices, and those requiring laryngectomy are able to talk by means of the pharyngeal muscles or an artificial larynx.

X-ray Treatment.—J. H. Webster⁷ states that Coutard's protracted fractional method is the only one he knows which can show convincingly good results after a long period of years. There are five essentials in this method of treatment: (1) The use of high voltage with special precautions as to filtration and focal distance, two directly opposing lateral fields with or without supplemental fields on the affected side; (2) Each dose must be protracted; (3) The doses are highly fractionated—at least two daily doses are given and the doses are divided up over two, three, four, or more weeks; (4) An extraordinarily high total dosage is given; (5) The dose must be carefully estimated beforehand and carefully controlled. By this method Coutard has had 32 per cent of three-year cures.

In the discussion of this paper Douglas Harmer said that he was satisfied that X rays are of the greatest value in the following conditions:—

1. Extrinsic carcinoma. (a) Early cases: before biopsy and as pre-operative treatment (short courses), and full courses after operation to prevent recurrence and dissemination. (b) Inoperable cases: as sole treatment.

2. Intrinsic carcinoma. In early cases the question of pre- and post-operative X-ray treatment requires careful consideration. In doubtful cases when the growths have proved more extensive than was expected, particularly after laryngectomy, post-operative irradiation will probably improve the prognosis. In late cases, although we are still unable to deliver a sufficient dose to be sure of destroying the whole of the disease, X rays still appear to afford the best treatment.

FULMINATING LARYNGO-TRACHEO-BRONCHITIS.

Lyman Richards⁸ says that too little attention has been paid to acute infectious laryngitis as a cause of respiratory obstruction. It is an acute infection of the upper respiratory tract with high fever, intense inflammation of the mucosa, tracheal wall, bronchi, and bronchioles, with formation of sticky exudate which may obstruct the airway. The patient is usually a child between 2 and 4 years old, with a slight head cold. The onset of respiratory obstruction is sudden. The condition is distinguished from laryngeal diphtheria by the absence of membrane and the presence of crusts of dried secretion in the glottis. Removal of the crusts gives temporary relief, but they re-form further down the tract as the condition advances. Tracheotomy or intubation is essential; Richards advises tracheotomy as it makes repeated bronchoscopy easier. Once crusting begins in the trachea and bronchi the only hope of cure is to remove the crusts whenever obstruction appears. As a rule, suction, even through the bronchoscope, is inadequate, and the crusts must be removed

with forceps. The secretion from the lung must be kept as fluid as possible by high liquid intake, steam tent, and instillation of sodium bicarbonate into the trachea. The prognosis is always grave, but repeated clearances of the trachea and bronchi offer a fair hope of recovery. An autopsy on a patient who died in the acute stage showed diffuse cellular infiltration and destruction of mucosa. In a patient who died eight weeks after the onset there was a replacement of the mucosa by stratified epithelium.

REFERENCES.—¹*Wien. klin. Woch.* 1934, i, 556; ²*L'Otorhinolaringol. Ital.* 1934, iv, 3; ³*Rev. de Laryngol.* 1934, iv, 341; ⁴*Ibid.* 326; ⁵*Surg. Gynecol. and Obst.* 1934, Feb., 431; ⁶*Ibid.* May, 841; ⁷*Proc. Roy. Soc. Med.* 1934, May, 901; ⁸*Ann. of Oto-Rhino-Laryngol.* 1933, xliii, 1014.

LEGAL DECISIONS AND ENACTMENTS OF RECENT DATE.

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None of the important decisions of the courts in the last two or three years—that is to say, important from the legal aspect—has been of especial interest to the medical profession. Quite a number of judgements have, however, been given which, although they do not lay down any new principles of law, yet illustrate existing ones from the medical man's point of view and serve to show how the main body of the law as administered to-day treats some of the matters in which he is most concerned.

On the legislative side, the last few years have not produced any great statutes of medical interest comparable to the Local Government Act 1929 or the Mental Treatment Act 1930. Nevertheless, quite a number of Acts have affected the profession in one way or another and are worthy of more than transitory attention.

The following notes of cases and statutes are selected from a large body of material. Apart from their subject matter they suggest in some measure the width and variety of the everyday contact of law and medicine.

LEGAL DECISIONS.

Of all forms of legal proceedings the most familiar to the doctor is, unhappily, the action against him for negligence, which in law is the breach of his duty to treat his patient with reasonable care and skill. The High Court heard this year an interesting case against a doctor for negligence not to his patient but to his dustman; and the Judicial Committee of the Privy Council considered on appeal an action against a Canadian hospital for allowing a patient to contract small-pox.

Fatal Explosion of Gas Cylinder.—In *Pattendon v. Beney*¹ (50 T.L.R. 10) the wife of a Doctor B asked a dustman P to take away, together with the house refuse, four gas cylinders. Neither she nor the doctor knew that the cylinders could be dangerous. A loud explosion was heard, and the dustman's mate found him sitting by the road in great pain. A cylinder lay in the road with its cap off. In hospital he appeared to have received a severe blow over the stomach, and died next day. The jury found: (1) That there was not enough evidence to prove that P was killed by the explosion of the cylinder, but that the cause of death was the handling of the cylinder; (2) That, assuming that the cylinder was dangerous in the condition in which it was delivered to the dustman, B did not know, but ought to have known, that it was dangerous; and (3) That P was not guilty of contributory negligence. They assessed the damages at £600. Mr. Justice Horridge said that as the jury had not found that P was killed as the result of the explosion, his widow could not claim damages from B. He thought that there was no danger in handing the cylinders to the dustman, but even if the cylinder had in fact been dangerous the finding of the

jury that B ought to have known this would not render him liable (*Bates v. Baley & Co. Ltd.*, 1913, 3 K.B. 351). His decision was confirmed by the Court of Appeal. Medical men would, it seems, do well to return their empty gas cylinders to the dealers and not to treat them as refuse. The law on the liability of a person delivering a dangerous chattel to another is not yet quite certain, and another case on similar facts might easily be decided against the doctor. By the doctrine of 'proximity', if one man is near to another a duty lies upon him not to do that which may cause a personal injury to that other (Lord Esher, in *Le Lievre v. Gould*, 1893, 1 Q.B. 497). The court might well hold on other facts that a doctor is 'near' enough to his dustman to owe him the duty of taking reasonable care to avoid injuring him.

Infection Contracted in Hospital.—In *McDaniel and another v. Vancouver General Hospital*,² a girl suffering from diphtheria was admitted to a hospital for infectious diseases. Nine days after discharge she developed small-pox. She had not been vaccinated. She occupied a separate room, and from time to time, on various days before she left, seven cases of small-pox were placed on the same floor, one of them in the adjoining room. The Supreme Court of British Columbia awarded \$5000 to the girl for personal disfigurement and \$545 to her father for medical expenses and general damages, together with costs. The Court of Appeal of British Columbia, by a majority, affirmed this judgement. The hospital appealed to the Judicial Committee of the Privy Council. The Committee, while offering no opinion on the relative merits of the 'unit' system and the 'isolation' system in the treatment of small-pox, found that the system adopted in the hospital was in vogue throughout Canada and the United States. The technique had been endorsed by every medical witness who gave evidence for the hospital. Dr. McEachern, associate-director of the American College of Surgeons, who was responsible for an annual survey of 3464 hospitals in North America, had testified that the system was the best known to medical science to-day and that the proximity of small-pox patients to others, with a common nursing staff, was quite an accepted procedure in the modern method of handling infectious diseases. As the hospital had acted in accordance with general and approved practice it could not, said the Committee, be found guilty of negligence. The judgements of the Privy Council do not bind the English courts, but this finding is undoubtedly in strict accordance with English law.

X-ray Examination of Insufficient Area.—Sitting without a jury at Manchester Assizes on March 19, 1934, Mr. Justice Swift awarded £200 damages and costs to a Mrs. Medcalf against a general practitioner on the ground that although the doctor had advised an X-ray examination, he had only asked for an examination of the ankle and not of the whole leg from the toe-nail to the knee, and had thereby missed an uncommon fracture of a bone in the foot. If, thought the judge, he had applied his mind to ascertain the trouble, he could hardly have failed to find it out. A report of the case was published in *The Lancet*.³ It suggests that doctors, besides insisting on an X-ray of the injured part, should take care that the radiologist examines the whole of the area which may be affected.

Reasonable Remuneration.—Although not the chief concern of the profession, its fees are naturally a matter of great importance. If, as is usual, a doctor and a patient do not agree on a fee beforehand, the patient is supposed at law to have agreed to pay a fee which is reasonable considering all the circumstances. The amount of a reasonable fee is a matter for the court to decide, and the following are a few recent decisions of county courts in the matter.⁴ In *Paget-Tomlinson v. Tasker* (Horncastle C.C.) £10 10s. was held reasonable for an appendix operation performed at a hospital by an

honorary surgeon. In *Chevassé v. Mitchell* (Canelford C.C.), where the patient, a blacksmith, had expected to pay 10s. a visit, it was held unreasonable to charge more except for a night visit, and 30s. was held a reasonable charge for three visits in twenty-four hours. The patient had paid £5 a week in a nursing home, where he had injections at 10s. each; the judge allowed for these 6s. 6d. only, the price of the drugs.

In two other cases the court upheld the principle of fixing fees according to the size of the patient's house. In *Sprout v. Gaunt* (Otley C.C.) a patient's husband contested a bill based on a rate (including medicine and telephone calls) of 10s. 6d. to 15s. 6d., according to the time and duration of the visit. The doctor stated that the husband had been living in one of the largest houses in Rawdon, at a probable rent of £150 per annum, and a visit to such a house usually implied a fee of 10s. 6d. The patient's husband protested that his estimated rent was only £120 per annum, that his house was mortgaged to the bank, that his circumstances had changed, and that the charges should not have been higher than 5s. or 6s. with medicine. The judge held that the charge was immaterial, as the doctor should have been given the opportunity of reducing his charges and then he could have decided whether or not to continue to treat the patient. In *Storrs v. Moore* (Chelmsford C.C.) the patient objected to paying £21 in hospital for an operation on his wrist. The surgeon said he had spent two hours on the operation and had paid the anaesthetist £4 4s.; that he had charged 5s. per visit to the hospital and £1 1s. per visit to the patient's home, which was staffed by a butler, two indoor, and two outdoor servants. The judge allowed the amount claimed. In *MacGinty v. Dixon* (Croydon C.C.) the judge allowed £1 11s. 6d. for each of twenty-one visits at a distance of 12 miles, as against £3 3s. claimed by the doctor, to a patient in another practitioner's area, to whom etiquette required that a higher charge than usual should be made.

In the first weeks of March, 1934, a consulting surgeon sued a patient (*Ormerod v. Darnell*⁵) for £70 for three operations and five consultations in Lytham Infirmary, where he was an honorary consultant. The patient had been injured in a serious motor accident. His solicitor denied liability on the grounds that the Infirmary was a voluntary hospital, that his client was an in-patient, and that the consultant was an honorary official. He contended that the fees were out of proportion to the patient's means. The consultant, in cross-examination, said that he would have regarded it as distasteful to mention fees unless the patient had raised the subject first; that he had assumed that the patient would be receiving compensation. In reply to the judge, he said that in fixing his fees he was guided entirely by the doctor who called him in, and that he had actually written to the patient to suggest that he should modify his charges. The judge pointed out that the description of honorary surgeon applies only to the surgeon's relations with other members of the staff and that in the case under discussion the relationship of surgeon and patient was a business one—the surgeon looked to the patient to pay. He gave judgement, with costs, for £25, the amount which the surgeon would have charged had he realized that the patient could not afford the full fee. As *The Lancet* remarks, the decision is valuable as showing that the consultant to a hospital is entitled to be paid a fee, in cases of traffic casualties, by a patient who can afford to pay.

Hospital Fees Included in Damages.—A recent decision of the Court of Appeal⁶ suggests an occasional solution of the perennial difficulty which hospitals and doctors find in recovering their charges from patients injured in traffic accidents. The injured patient here was not, as it happened, a pedestrian, but the wife of a tenant who fell down some defective steps which it was the landlord's duty to keep in repair. She included in her damages

a bill from St. Luke's Hospital for £16, and the learned judge of the Brompton County Court allowed the addition. The landlord appealed, saying that her husband had not yet paid the amount to the Hospital and was under no legal liability to pay it. The Master of the Rolls, in giving judgement on the appeal, observed that it not infrequently happens that a husband is liable for doctor's fees which he has not yet paid when he brings his action for damages; as he has a liability to pay the doctor's bill, the amount is added to the damages. The same principle, he thought, applied here. The moral is simple: when treating a prospective litigant, render your account early and see that he includes it in his claim. Parliament has now enacted a provision (*see p. 242*) under which doctors and hospitals may recover a small fee for emergency treatment. Nevertheless, the main problem of recovering fees is still acute.

A Court Protects Medical Confidence.—Medical men are bound in honour to keep secret all information which they gain in their professional capacity. Nevertheless, they do not cease to be citizens, and judges have always held that a medical witness must, if required, divulge matters of professional confidence. Sometimes a doctor is bound to secrecy by his professional ethic and by statute alike, but even so he may be compelled under pain of imprisonment to tell in the witness-box what he knows. In *Garner v. Garner* (1920, 36 T.L.R. 196) Mr. Justice McCardie ruled that the medical officer of a venereal disease clinic must give evidence of the condition of an ex-patient even though under the national scheme for the treatment of venereal disease there is a statutory regulation enjoining absolute secrecy on all medical men treating patients under the scheme. Recently, however,⁷ the learned judge of the Mayor's and City of London Court absolved a tuberculosis officer from giving evidence which would have infringed professional confidence. A tuberculous patient, A, under periodical supervision at a London tuberculosis dispensary, was employed as a telephone operator by a City firm. He was ordered sanatorium treatment and replaced by B. Four years later B developed phthisis and sued the firm for compensation under the Workmen's Compensation Act, on the ground that he had caught the disease from the instrument used by A. He served a subpoena on the Tuberculosis Officer at the dispensary to attend and produce the records showing A's condition and treatment. The doctor protested on the ground that to do so would be a breach of the confidence he owed A, generally as his medical attendant, and specially by statute as a Tuberculosis Officer. He pointed out that the Public Health (Tuberculosis) Regulations 1930 lay down by their Article 10 that all documents dealing with patients notified under these regulations should be regarded as confidential, and that under Section 1(3) of the Public Health Act 1896 he was liable to a penalty of £100 if he refused to obey the regulations. The judge upheld his objection. *The Lancet* commented that as compulsory notification of disease is in itself a breach of professional confidence which is imposed on a doctor by statute, the secrecy which the statute directs is all the more necessary. In the case of *Garner*, a wife petitioning for divorce wished to prove that her husband had been treated for syphilis. Venereal disease is not compulsorily notifiable, but the secrecy which is guaranteed to patients under the national scheme is undoubtedly a very important factor in its success. It may be that the existence of compulsory notification of tuberculosis induced the learned judge of the City of London Court to take a different view from that of Mr. Justice McCardie, but in any event, as *The Lancet* remarks, the case forms a valuable precedent.

Use of Words 'Physician and Surgeon'.—Anyone, qualified or not, may practice medicine or surgery, but he must not assume qualifications he does not possess. In *Whitwell v. Shakesby* (1932, 48 T.L.R. 489) an unqualified

person affixed to his premises a name-plate bearing the words: 'Bonesetter—Osteopathic Physician and Surgeon'. By Sect. 40 of the Medical Act 1858 it is an offence to use, wilfully and falsely, the titles physician or surgeon (among others), implying that the user is recognized as such by law. The Medical Defence Union prosecuted him at the Marylebone Police Court. The stipendiary magistrate found that he had used the titles wilfully, but that by the use of the words 'bonesetter' and 'osteopathic' he had so qualified the titles 'physician and surgeon' that they became merely an amplification of the description 'bonesetter', and therefore he did not use the titles falsely. The King's Bench Division allowed the appeal by the prosecutor and ordered the magistrates to convict. Lord Hewart, Chief Justice, said the words appeared to convey that the respondent had qualifications which in fact he had not and which the Medical Act 1858 prevented him from assuming without the lawful right to do so. Mr. Justice Avory agreed with the learned magistrate that the words 'physician and surgeon' were an amplification of the description 'bonesetter', and that by that amplification the respondent represented himself to be in fact a physician and surgeon, and thereby implied that he was recognized by law as a physician and surgeon.

The statutory restriction on the use of these words applies to dentists as well. It was decided in *Attorney-General v. Weeks* (1932, 1 Ch. 211) that even a 'Dentist 1921', admitted to the Dental Register on account of previous practice, may not call himself a 'dental surgeon', because if he does so he implies that he had in 1921 qualifications registrable under the Dentists Act 1878.

General Medical Council.—A registered practitioner cannot avert the consequences of any irregular conduct he has committed by merely asking the General Medical Council to remove his name from the Register. In *R. v. General Medical Council* (1930, 1 K.B. 562) a medical man applied under Chap. 13 of the Standing Orders to have his name removed from the Register at his own request. Before the Council heard his application they received information that he had been guilty of infamous conduct in a professional respect—i.e., advertising with the object of attracting patients—and after due inquiry ordered the Registrar to erase his name. The practitioner applied for a writ of *mandamus* commanding the General Medical Council to delete all records of the penal removal. The King's Bench Division refused him a writ, and he appealed. The Court of Appeal held that a practitioner is not entitled to have his name removed from the Medical Register on his mere application for the purpose. Until the Council orders his name to be removed he is still a registered medical practitioner, and the Council may, after due inquiry, order his name to be erased for infamous conduct.

A Medical Society's Income Tax.—In 1931 (S.C. 625) the Aberdeen Medico-Chirurgical Society made a gallant attempt to avoid paying income tax on the assessments made under Schedule A in respect of its hall and house. It appealed on the ground that it was a "literary or scientific institution" under Rule 1(3) of Schedule A, No. VI, of the Income Tax Act 1918. Its objects as set forth in its by-laws include the interchange of scientific ideas, social intercourse, the maintenance among members of the standard of professional conduct, and the advancement of the interests of the medical profession. It holds monthly scientific meetings and maintains a technical library. Its appeal failed, the Court of Session holding that when a society's activities are partly literary and scientific and partly professional, the court must decide on their prevalent or main character, and that the appellant society was substantially a professional association, of which the leading purpose was to promote the professional interests of its members. The General Medical Council failed

in a similar attempt a few years ago, but the recently-formed College of Obstetrics and Gynaecology has succeeded in obtaining relief, presumably because the Commissioners considered that its prevalent character was literary or scientific.

The Medical Referee.—Several important decisions have recently been given on the powers and duties of the medical referee in Workmen's Compensation cases. The House of Lords has held that the medical referee's power (W.C. Act 1925, s. 43 (1)) to review a certificate is not confined to deciding whether the certifying surgeon should or should not give a certificate of disablement, but covers the whole range of the certifying surgeon's action in giving or refusing to give a certificate. For instance, the medical referee may alter the date on the certificate given by the certifying surgeon as the day on which a disability began (*Wemyss Coal Co. v. Haig*—1933, A.C. 643).

The medical referee often finds that a workman who has suffered from nystagmus has completely recovered from that particular attack, but that he is more liable to disease than he was before. In this event, however hard the decision may appear, it seems that the medical referee should certify that the man has completely recovered. In *Hamilton v. Kinneil, etc., Co.* (1933, W.C. & Ins. Rep. 1), a Scots case, the Lord President of the Court of Session expressed the opinion that increased susceptibility to nystagmus gives no grounds for finding that the workman has not completely recovered. This state of the law has led to considerable uncertainty. For instance, in *Penrikyber etc., Co. Ltd. v. Edwards* (1933, A.C. 28) a workman was certified as suffering from nystagmus on Oct. 17, 1920, and the employers paid compensation until January, 1930. In February they obtained a certificate from the medical referee that the workman was not then suffering from nystagmus but from defective vision due to other causes, and that his sight was only good enough for work on the surface. In March, 1930, the workman obtained a certificate from the certifying surgeon that he was suffering from nystagmus which had begun in October, 1920, and that no change had occurred in his condition since. The workman applied for arbitration; the arbitrator held that the certificate of the medical referee was conclusive and refused compensation. The Court of Appeal set aside this award. The House of Lords sent the case back to the arbitrator to ask the medical referee whether or not he intended by his certificate to certify that the workman had completely recovered from the attack, in the sense that he was not, after and in consequence of the attack, more susceptible to the disease than he had been before it. The medical referee replied that the fact that the workman had suffered from nystagmus showed him to be predisposed to it; he explained that his certificate meant that the workman had now recovered from nystagmus but that if he went underground he was likely to develop a second attack in a much shorter time than it had taken to produce the first. The House of Lords therefore reversed the Court of Appeal, and held that the certificate meant that the man had completely recovered. Again, in *McNicholas v. West Leigh Colliery Company* (C.A. 1933, W.C. & Ins. Rep. 123) the medical referee's certificate indicated that the workman had not suffered from his nystagmus as a result of constitutional susceptibility; that there was no present sign of the nystagmus though there might be something latent; that if he had nystagmus again it would be a repetition of the earlier attack, and that a recurrence was probable because the conditions caused by the first attack had not completely passed away. The Court of Appeal held that as the referee affirmed there was no present sign of nystagmus, the workman could not be awarded compensation but only a declaration of liability. Another decision that seems liable to press hardly on the workman, and to call for an alteration in the law, is that of the House of Lords in *French v.*

Archibald Russell, Ltd. (1934, 50 T.L.R. 451). Their lordships held that a miner whom the medical referee had certified as recovering from nystagmus and fit for work could not have compensation for total incapacity although in fact no colliery would employ him, because he could not sign a declaration that he had never had nystagmus. The cause of his incapacity was not his disease, but the fact that he could not make the required declaration. There seems little doubt that Parliament will have to adjust this matter before long.

NEW LEGISLATION.

Emergency Treatment in Motor Accidents.—The increase in motor accidents has led to widespread complaint by private practitioners and hospitals alike that they are often unable to recover payment for services which they are called upon to render in emergency and which they are not in a position to refuse. The Road Traffic Act 1934 (ss. 16, 17) contains a provision that when treatment or an examination is immediately required as a result of a motor accident, and is given by a registered practitioner, the person using the car must pay the doctor a fee and expenses. If more than one doctor gives emergency treatment, the car-user need only pay the first to give it. The amount of the fee is 12s. 6d. for each person treated, and the expenses are 6d. a mile, coming and going, for any journey the doctor has to make over two miles from where he is called. If treatment is first given in a hospital, the fee is payable to the hospital. The doctor or executive hospital officer may make the claim by word of mouth at the time; otherwise he must make it by request in writing, and serve it on the user within seven days. The request must be signed by the claimant and must state his name and address, the circumstances in which the treatment was effected, and that it was first effected by the claimant (or hospital). Service means delivering the request to the person who was using the vehicle, or sending it in a prepaid registered letter to his usual or last-known address. If the user refuses to pay, the amount can be recovered as though it were a simple contract debt, i.e., in the county court. It seems as though the doctor had to make sure at once who, out of a possible number of occupants of a car, is the user, for if he serves his request on the wrong one his seven days will probably have elapsed before he can remedy his mistake. The chief officer of police must give the doctor any information he can about the identification marks of the car or the name and address of the user. If more than one motor vehicle is involved, presumably the doctor can claim against any of the users. Time alone will show to what extent these provisions guarantee a doctor or hospital remuneration for emergency services.

Sale of Poisons.—The Pharmacy and Poisons Act 1933 contains a comprehensive scheme for regulating more strictly the sale of poisons and of substances containing them. A Poisons Board, on which the medical profession is represented, is set up and is to prepare two lists of poisons: one of poisons which may only be sold by an authorized seller of poisons, and the other of poisons in common and non-medical use, which may be sold also by persons on a list kept by the local authority. (Authorized sellers of poisons are registered pharmacists and concerns under their control.) Poisons may no longer be sold in automatic machines. The Act does not affect in any way the right of a doctor to supply or buy medicines for treatment.

The Act has been criticized for allowing a large number of persons without any technical knowledge of chemistry to sell poisonous substances not used as medicine, and fears have been entertained lest the latitude of the provisions may lead to an increase in suicide. There seems little ground in the terms of the Act for such gloomy suggestions.

Dangerous Drugs.—The Dangerous Drugs Act 1920 put heavy restrictions on the import, sale, and use of opium, morphine, cocaine, ecgonine, and di-morphine (heroin). As a result of research by the Health Committee of the League of Nations, a number of nations, including Great Britain, signed the Geneva Convention (No. 2), which binds them to restrict traffic in a number of other drugs as well. The Dangerous Drugs Act 1932 enacts the provisions of this convention. It amends the Act of 1920 by adding to the list of 'dangerous'—i.e., addiction—drugs extracts of Indian hemp, ester of morphine and ecgonine, synthetic derivatives of morphine, and thebaine. Codeine and dionin are excepted, but power is reserved to include them at any time by Order in Council. It is forbidden to make or trade in any products of the phenanthrene alkaloids of opium or of the ecgonine alkaloids of coca leaf which were not used for medical and scientific purposes on July 13, 1931. If, however, any such product shall appear to be of medical or scientific value, it may be exempted by Order in Council.

Medical Officers of Health.—By the Local Government Act 1933 the Minister of Health may make regulations for the qualifications and duties of Medical Officers of Health and their conditions of service. A M.O.H. must be on the Register, and in a district with a population of more than 50,000 he must have a special public health qualification. Local authorities need not comply with the Minister's regulation about conditions of service, but they cannot then claim half the M.O.H.'s salary from the County Council, as they otherwise can. If the Minister certifies to the County Council that the M.O.H. has failed to send him the reports and returns required by regulation, or to give the county M.O.H. such information as the latter may reasonably require, the county must pay the half-salary to the Exchequer and not to the council employing the M.O.H. A M.O.H. of a county borough or district who engages not to carry on private practice and is paid partly by the county, must be appointed for an unlimited time and can only be dismissed by or with the consent of the Minister. If these provisions are not complied with, the district will forfeit the county's contribution. County Councils are to make arrangements for Medical Officers of Health of county districts to be restricted from practising in private, but the Minister may dispense with the restriction if he sees fit. The Minister may unite districts for the purpose of appointing a M.O.H., and then none of the districts can appoint a M.O.H. except as assistant to the officer for the union. The Minister settles disputes between the district and the county Medical Officers of Health. An authority with power to appoint a M.O.H. may also, with the consent of the Minister, appoint a deputy or temporary M.O.H., to whom they may pay such reasonable remuneration as they may determine, and whose office they may terminate at their pleasure, subject to the notice provided in their contract with him. The county contributes under the same conditions as above.

The Court Expert.—Many hard things have been said from time to time about the partiality of expert witnesses, and proposals have often been made that the court itself should appoint an expert to advise it in technical matters, either as a witness or an assessor, as is done in some Continental countries. This summer the Rules Committee of the Supreme Court made for the first time a set of rules governing the appointment of a court expert,⁸ and before long it should be possible to judge the value of the innovation in practice. The rules apply only to non-jury cases which involve a question for an expert witness. Any party to such a case may ask the judge to appoint an independent expert to inquire and report upon any question of fact or opinion which does not involve questions of law or construction. The judge has discretion to grant the application or not. If he does, the expert is appointed.

If possible, the parties agree on an expert and the question or instruction he is to be given: if they cannot agree, he is nominated and his duties are settled by the judge. The judge may if necessary appoint more than one expert. If an expert wants to make an experiment which will involve expense or the attendance of persons, he tries to arrange the matter with the parties or their solicitors; if he fails, the judge decides what is to be done. His remuneration is fixed by the judge and includes a fee for his report and for any supplementary report, and a proper sum for each day on which he has to attend in court or before an examiner. Each and all of the parties is liable for this remuneration, and the judge may order the party applying for the expert to give security for it. The expert makes his report in writing with such copies as the court requires, and each party receives one. The report, as far as it is not accepted by all parties, is treated as information furnished to the court and given such weight as the court may think fit. The judge may order a supplementary report at any time. Any party may apply to cross-examine the expert on his report, and the judge then makes an order for the cross-examination of the expert by all parties at the trial, or else before an examiner. Parties may also call expert witnesses, one each without leave and more with leave.

If, as seems quite probable, these rules provide important and valuable evidence and save expense to both sides, they will greatly help the administration of justice. They should, incidentally, reduce the frequency with which the medical profession is held up to derisive comment on account of the appearance on opposite sides of contradictory teams of medical witnesses.

Survival of the Personal Action.—Until this summer it was part of the common law that the right to bring an action for personal injury died with the person; or, in the well-known phrase, "*actio personalis moritur cum persona*". The effect of the "*actio personalis*" rule used to be that if a person died of injuries caused by negligence, his relatives could claim no redress. If he died during the trial of the suit for damages they could not even continue it, and still less could they bring an action on their own. Similarly, they could not be sued for a personal wrong committed by him. The rigour of the rule was modified by Lord Campbell's Act—the Fatal Accidents Act 1846—in favour of near relatives dependent on the dead person, but even these can only claim compensation up to the extent of their dependency, and have to bring their action within a year. Worse still, if a negligent motorist died after injuring someone, the injured party could get no redress, even from the offender's insurance company.

Now, however, the rule has been much weakened by the Law Reform (Miscellaneous Provisions) Act 1934, which provides that when a person dies, any cause of action which he may have had, or which may have lain against him, shall survive instead of, as before, dying with him. There are some exceptions, such as defamation and matrimonial causes, but actions for negligence are included. There must not be any exemplary damages, nor any for loss to his estate caused by his death, except to cover funeral expenses. The rights of dependents under Lord Campbell's Act are preserved. The Act does not apply to Scotland.

The learned writer of a leading article in the *British Medical Journal*⁹ points out a possible application of the Act to medical men. If, he suggests, a patient dies on the operating table, the surgeon will be exposed for the next six years (the maximum time allowed by the Statute of Limitations) to the risk of an action by the personal representatives (the executors or administrators), who may not even have been dependent on the deceased or related to him. The writer adds that a doctor may be unexpectedly sued by the representatives of a former patient who has died, within six years of some treatment or

operation, from a cause quite unconnected with it. Both these actions, he points out, may be brought although the patient, had he lived, would have been the last person in the world to charge the doctor with negligence.

These comments are theoretically a true statement of the law, but it is possible to take almost any statute and paint pictures of the hardship it is capable of causing in a hypothetical case. In the first instance, that of the patient who dies on the operating table, it is hard to see exactly what damages the personal representatives could claim except funeral expenses. There is no question of compensating any particular survivors for his loss; he has suffered no special damage capable of being assessed in money, and although presumably his estate loses by his death in the sense that if he had lived he might have increased it, yet the Act does not allow damages for this loss. In the other instance, that in which an ex-patient dies some time after treatment from an unrelated cause, there is perhaps a little more risk. If, for example, a patient were unsuccessfully treated for a fracture and developed arthritis, and suffered loss of earning power for some years and spent large sums on spa treatment, and then died of intercurrent disease, the personal representatives might be able to make good a claim that his estate had been impoverished by a certain definite sum through the negligence of the original doctor. In this case the loss is not due to the death, and damages may be allowed. The personal representatives would, however, have to explain why the patient never thought it worth while to sue while he was alive, and an unconvincing answer would go against them. Moreover, in neither of these instances would it be very easy to prove negligence. The danger is probably far less, therefore, than the learned writer maintains.

The Act has also been criticized for not going far enough. A leader-writer in *The Lancet*¹⁰ protests against the provision by which, when anyone dies as a result of a motorist's carelessness, the estate can recover only the funeral expenses and certain out-of-pocket expenses incurred before death, and not the expenses of medical or hospital treatment, which may therefore have to be borne, as they often are now, by the doctor or institution who gave it.

The truth probably is that the Act was passed to give injured parties compensation out of the estate of a deceased negligent motorist. It is usual in a statute to give equal rights to both parties, but Parliament took especial care in drafting the Act not to open the door to new and startling actions of the kind imagined by the writer of the *British Medical Journal* article and, incidentally, by certain contributors to the lay press.

REFERENCES.—¹*Sol. Jour.* 1933, lxxvii, Oct. 14, 732; ²*Law Jour.* 1934, lxxviii, 146; ³*Lancet*, 1934, i, 706; ⁴*Sol. Jour.* 1933, lxxvii, 247, 316, 480; ⁵*Lancet*, 1934, i, 536; ⁶*Ibid.* ii, 953; ⁷*Ibid.* 835; ⁸*Rules of the Supreme Court*, No. 2, 1934, dated May 29, 1934, No. 522.L.12; ⁹*Brit. Med. Jour.* 1934, ii, 600; ¹⁰*Lancet*, 1934, i, 1177.

LEISHMANIASIS. (See KATA-AZAR.)

LEPROSY.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY AND PROPHYLAXIS.—The incidence of leprosy in British Guiana and the West Indies is dealt with by F. G. Rose,¹ who gives a table of the official incidence varying from 1.1 per mille in Trinidad to 0.1 in Jamaica and with an average of 0.5; but excluding Jamaica the rate is 0.9. British Guiana is the only area with compulsory notification and out-patient clinics since 1931 and has a rate of 0.9 per mille, so he considers the rates for the West Indian Islands are below the correct figures. Leprosy and its prophylaxis in Malaya is reported on by G. A. Ryrie,² where the law requires every leper to be in isolation, and he thinks the majority of obvious lepers are segregated; he estimates the rate at about 0.1 per mille. The Penang Island settlement accommodates

700 to 800 patients, and the Kuala Lumpur one about 1000. Leprosy in Ceylon is dealt with by R. G. Cochrane³ after a personal tour to the island, where compulsory segregation is organized under the Leper Ordinance of 1901 in institutions and homes, and is unsatisfactory in the case of infective, and unnecessary for uninfected lepers, while only advanced cases are discovered and dealt with in two leper asylums. In Colombo he found 3 per mille of the school children to be infected. He advises modification of the leper ordinance to make it less rigid, and examination of all contacts to detect early cases, and that compulsion should only be used exceptionally, as it defeats its own purpose by preventing early amenable cases coming forward voluntarily to obtain treatment without isolation in accordance with modern methods, and he thinks that the Ceylon leper problem could be successfully dealt with in this way.

ETIOLOGY.—A very instructive case of accidental inoculation of leprosy is reported by E. Marchoux⁴ in a medical assistant who was pricked by a needle during an operation for removal of a leprosy nodule; eight to ten years later, when in a bad state of health, he developed a local acid-fast-bacillus-containing lesion in the injured finger. Bacillæmia in leprosy is discussed by J. Lowe,⁵ who lays stress on the fallacy of acid-fast bacilli being obtained from the skin in puncturing a vein. He describes a method of concentrating the bacilli in the blood by removing the red corpuscles and serum by the centrifuge, and dissolving the remaining white corpuscles in 1 c.c. of 10 per cent anti-formin, but he still only succeeded in finding the bacilli in the vein blood of 2 of 23 nerve and in 25 of 28 cutaneous cases; in 15 out of 21 of the latter they were also found in smears of the punctured skin, so may have been derived from the skin during puncture of the vein. He concludes that the bacilli are very rare in circulating blood, so vein puncture is of little diagnostic importance. The same investigator⁶ deals with rat leprosy with illustrations of the microscopical changes induced by the disease, which is a generalized infection with the production of leprosy nodules in the spleen and liver to an extent not seen in the human form. He reviews the reports of cultures of the acid-fast bacillus of the disease, and agrees with the conclusion that they have not been successful and that generalized rat leprosy has never been induced by the injection of cultures, while he found no evidence of a filterable virus stage of the organism or of any direct action of sodium hydnocarpate on the bacillus *in vitro*.

CLINICAL.—A full description of the naked-eye and microscopical appearances of tuberculoid leprosy, so common in South Africa, has been published by H. W. Wade⁷ as a recognizable clinical variety of the disease with a granular surface and linear lesions, and showing giant cells with very few lepra bacilli, and often undergoing complete resolution. The sex incidence of leprosy is dealt with by J. Lowe⁸ on the basis of the literature and his experience, and he gives a curve showing very similar incidence in the first fifteen years of life, a slightly higher rate in females during puberty, and the well-known much higher male ratio after 25 years of age. He thinks both physiological and environmental influences play a part, and that important sources of infection outside the house and family are indicated. The diagnostic and prognostic value of Mitsuda's intradermal leprolin test is reported on by E. Muir.⁹ He used emulsions of the bacilli of both human and rat leprosy of Stephansky in his tests, which he calls H and S respectively, and obtained positive reactions with the H leprolin in both healthy persons and in recovered cases of leprosy, but negative ones in active dermal cases of the disease, in which the tissues have become accustomed to the toxins of the lepra bacilli; but such cases react to the S leprolin, as do healthy subjects. In very young children reactions are negative or slight. A strong reaction indicates a good prognosis in a case.

TREATMENT.—A valuable review of the present position of leprosy treatment has been published by E. Muir,¹⁰ with a full list of references. H. H. Anderson, G. Emerson, and C. D. Leuke¹¹ record a pharmacological evaluation of certain chaulmoogra derivative antileprotic drugs; these include toxicity and therapeutic tests on rats, leprocidal effect *in vitro* on the leprosy and other acid-fast bacilli, and therapeutic effects in leprosy rats. The substances tested include the two most commonly used in the treatment of leprosy, namely 'alepol' and the ethyl esters of chaulmoogra oil, two water-soluble synthetics prepared by Wrenshall, No. 921 (sodium chaulmoogryl p-phenetidine sulphonate) and No. 923 (sodium di-hydro-chaulmoogryl p-phenetidine sulphonate), and a third preparation of Adams, di-N-heptyl acetate. They came to the conclusion that the most effective were the *ethyl esters of chaulmoogra oil and alepol*, and next came ethyl-di-N-heptyl acetate, and the least so were the two p-phenetidine sulphonates. They advocate all new proposed remedies being submitted to similar tests before being used on man. At the Kigezi colony in West Uganda L. E. S. Sharp¹² has made a comparative test in the severe cases of nodular leprosy prevailing there of hydnocarpus preparations with controls to ascertain the effect of improved hygiene and diet, and he found very little difference in the results in the two series. J. Rodriguez¹³ writes further on his recorded experience that chaulmoogra preparations have very little effect in incipient cases of leprosy with no acid-fast bacilli in the lesions, although he holds that "the chaulmoogra preparations are of real value in the treatment of leprosy". He suggests that the drug may be less efficient "against the non-acid-fast stages of *M. lepræ*, which are believed by some workers to be responsible for the earliest manifestations of leprosy". B. Moiser, in his report for 1933 on the Ngomahauru Leprosy Hospital in Rhodesia,¹⁴ reports favourably on the use of iodized chaulmoogra esters in all stages of leprosy, including some advanced nodular ones, and as it is impossible to state without trial what cases will improve, all new patients are treated, and he considers that "curability is by no means confined to early cases", but the later stages require more prolonged treatment. An analysis of 722 cases shows 30 per cent discharged, 47·3 per cent improved, 7·9 per cent stationary, 1·1 per cent worse, 13·7 per cent died, and 30·8 per cent had become negative. The total number discharged as 'arrested' was 271, of whom 6 have been re-admitted for further treatment.

REFERENCES.—¹*Internat. Jour. Leprosy*, 1933, July, 337; ²*Ibid.* 1934, Jan.-March, 77; ³*Leprosy Review*, 1934, April, 64; ⁴*Internat. Jour. Leprosy*, 1934, Jan.-March, 1; ⁵*Ind. Med. Gaz.* 1933, Sept., 503; ⁶*Ind. Jour. Med. Research*, 1934, July, 187; ⁷*Internat. Jour. Leprosy*, 1934, Jan.-March, 7; ⁸*Ibid.* 57; ⁹*Leprosy Review*, 1934, April, 83; ¹⁰*Internat. Jour. Leprosy*, 1933, Oct., 407; ¹¹*Ibid.* 1934, Jan.-March, 39; ¹²*Leprosy Review*, 1933, Oct., 151; ¹³*Ibid.* 1934, July, 102; ¹⁴*Ibid.* 1933, Oct., 149.

LEUCORRHŒA.

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

An excessive discharge from the vagina may arise from one of three sources, vagina, cervix, or corpus uteri, and, generally speaking, may be grouped as of infective or non-infective origin. Leucorrhœa is a common complaint amongst married women, the cause of the increased discharge being related in most instances to cervical infection following labour, abortion, or gonorrhœa. Although relatively uncommon in virgins, excessive vaginal discharge is by no means unknown, and most practitioners are probably consulted sooner or later on points related to its pathogenesis.

Virginal leucorrhœa has recently formed the subject of an investigation by R. Cruickshank and A. Sharman,¹ and their observations upon the origin of excessive vaginal discharge of the non-infective type are of some interest. The reaction of the secretion in all cases is highly acid, varying from P_H 4·2 to

headaches coming on immediately after lumbar puncture, Masserman believed that intracranial hypotension might be a factor. When, however, the headache supervenes some hours after the lumbar puncture, low pressure, he suggests, is unlikely to be responsible, since he believes that the intracranial pressure will have returned to its normal level within one to two hours. The incidence and severity of post-puncture symptoms is directly related to the extent and rapidity of the reduction in cerebrospinal fluid pressure at the time of drainage, according to the experience of B. J. Alpers.⁵ Masserman therefore believes that the delayed post-puncture symptoms are due not alone to a simple mechanical alteration in subarachnoid hydrostatics, but also to morbid physiological disturbances within the central nervous system, such as vascular engorgement, and oedema of the tissues.

REFERENCES.—¹*Arch. Dermatol. and Syph.* 1930, xxi, 615; ²*Amer. Jour. Med. Sci.* 1928, clxxv, 371; ³*Ibid.* 1934, l, 247; ⁴*Arch. of Neurol. and Psychiat.* 1934, xxxii, 523; ⁵*Ibid.* 1929, xxii, 806.

LUNG, ABSCESS OF.

J. F. Gaskell, M.A., M.D., F.R.C.P.

S. U. Marietta¹ discusses the medical treatment of acute pulmonary abscess and gives details of 50 cases under his own care: 34 of these were treated by medical means alone; 20 were cured and 9 improved. The remaining 5 died; 2 of these refused surgical treatment and 1 died three days after admission. His figures therefore bear out the view of other authors that at least 50 per cent of cases are curable by medical means alone. He defines an acute abscess as an abscess not yet walled-off by fibrous tissue and therefore collapsible, a better definition than one dependent on the mere time of its existence. X-ray examination is valuable as it demonstrates the presence of any fibrous wall. When this is once present, surgery gives the only hope of cure. In the early cases treatment is expectant until rupture into a bronchus takes place; this usually occurs within two weeks and is signalized by the sudden bringing up of large quantities of purulent material.

The essential part of medical treatment is *postural drainage*, which can be carried out under supervision quite successfully in the patient's home. The patient first lies four to five minutes on the healthy side to allow purulent material to drain out into the bronchi. He is then inverted, lying across the bed face downwards with the hips at its edge, the body in the vertical position, and the head near the floor. This position should be held for three to five minutes, and most patients can soon endure ten minutes. It should be done four times a day or oftener about half an hour before meals and at bedtime. The bulk of the sputum is usually brought up after the period of inversion, this having brought it into the main bronchi, whence it is coughed up. Treatment should be continued after the condition has apparently cleared up. Marietta keeps patients in bed for one month after the temperature has become normal, takes one month getting them up, and gives one month's convalescence; postural drainage is continued through all three periods. He finds that even in upper-lobe cases postural drainage is necessary. All sedatives are contra-indicated, but potassium iodide and ammonium chloride help to lower viscosity. Surgical measures are necessary if cases become chronic with rigid walls. Pneumothorax is usually definitely contra-indicated owing to the fact that it invalidates the cough impulse. *Bronchoscopic aspiration* is of great value to assist postural drainage and also bronchoscopic clearance of obstructions.

E. B. Emerson² also emphasizes the great value of bronchoscopy for diagnosis and treatment, and gives a series of cases of abscess, bronchiectasis, and pulmonary tuberculosis thus treated with much benefit.

C. Jackson and C. L. Jackson³ analyse the factors in effective natural peroral drainage. These are three—ciliary action, 'bechic blast' due to expiratory air expulsion in the lower bronchi, and 'tussive squeeze' due to the muscular efforts of coughing. If bronchoscopy is done without abolition of the cough reflex, after pus has been aspirated from the large bronchi, fresh pus can be seen to be squeezed out from the lung at each cough. In nature viscosity is lowered by putrefaction, making the bechic blast more effective. Putrefaction, however, causes damage to the bronchial walls, which is obviated by catheteric aspiration. Bronchoscopic clearance of obstructions should also be done once a week. The authors agree that all operations which lower bechic blast, such as phrenic avulsion, are contra-indicated.

Th. Luccherini⁴ has used *diathermy* in the treatment of pulmonary abscess and gangrene with success. His method is to apply lead electrodes of equal size to the anterior and posterior surfaces of the affected side of the chest so that the current passes through the whole of the lesion. The electrodes must adhere perfectly to the skin. He uses currents of from 1 to 1.5 amperes with 10-minute, 20-minute, and 30-minute periods for the first three applications, then continuing with 30-minute periods daily. He has given up to seventy applications, and finds that general improvement has followed in all his six cases. The patients put on weight, fever disappears, also cough and pain, and the sputum loses its foetor and becomes scanty. He claims that the method is very simple and is worth consideration.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1934, cii, April 28, 1363; ²*New Eng. Jour. Med.* 1934, Feb. 15, 365; ³*Amer. Jour. Med. Sci.* 1933, Dec., 849; ⁴*Policlinico*, 1933, Oct. 30, 1715.

F. W. Wathyn-Thomas, F.R.C.S.

J. Maxwell¹ discusses lung abscess in a paper based on the findings of 315 cases discovered in two consecutive series, in all 11,006, of post-mortem examinations in the records of St. Bartholomew's Hospital (1907-31) and of the Royal Chest Hospital (1922-31). Every case in which suppuration was present in the lung tissue has been included, with the exception only of those cases in which tuberculosis appeared to be the sole cause. This ensures us against any 'selection' of cases.

Maxwell points out the confusion arising from the use of the term 'gangrene', and includes as 'lung abscess' "all cases of non-tuberculous cavitation with suppuration." His classification is anatomical, thus:—

I. *Single.*

Unilocular	{ Hilar Central }	(a) open	to	Bronchus
Multilocular	{ Peripheral Lobar }	(b) closed		Pleura

II. *Multiple.*

He comments on the statement that lung abscess is becoming more frequent, but concludes that it is not possible to decide whether there has been a real increase or whether greater accuracy in diagnosis has led to more general detection of the condition.

In the single abscess group there were 199 cases; in 149 (nearly three-quarters) the abscess was unilocular.

The sex distribution in this series agreed with the accepted ratio, 3 males to 1 female. The age incidence also agreed with other published records: 113 cases were patients between 40 and 70 years of age. This may be associated with the carcinoma age incidence.

The greatest difference from the usual records, especially from the United States figures, is in the causal conditions. In the whole group only 2 cases followed tonsillectomy, and 3 tracheotomy; 7 cases followed otitis media, with lateral sinus thrombosis in 3; 38 cases followed abdominal operations; carcinoma of the bronchus or œsophagus was responsible for 48 cases; and pneumonia for 43. It is noticeable that no case in this group was attributed to nasal accessory sinusitis.

The right lung was attacked more frequently than the left, and in each lung the lower lobe was affected more than twice as often as the upper. It will be seen from this that the figures give us little help in deciding whether aspiration or embolism is the usual cause of lung abscess. It is generally agreed that embolism would be more likely to affect the right lower lobe than any other part of the lung; unfortunately so would aspiration, and the high incidence of infection at this site can be explained equally well on either view. It is probable that the nearer the abscess is to the hilum, the more likely it is to have been caused by aspiration; the figures show, on the whole, a greater predilection for the periphery, which suggests embolism as the more common cause. In the 38 cases where an abdominal operation had been performed there was pre-operation sepsis of the site in 29; sepsis elsewhere in another 3; and bronchopneumonia in the remaining 6. Therefore in 32 embolism was the probable cause. Cerebral abscess was found only in 4 cases, and in 3 an empyema was present as well. This low incidence is remarkable; Tuffier placed it at 13 per cent in his series.

The 116 cases of multiple abscess show a slightly lower male incidence (82 males and 34 females), and a much more generalized age incidence (72 cases in the first four decades). Carcinoma of the lung and œsophagus was responsible for 9 cases, abdominal operations for another 9, acute pulmonary conditions for 6. There were no cases following tonsillectomy. The largest 'causal group' was "septic conditions elsewhere," with 62 cases. In this group there were 2 cases of nasal sinusitis and 11 of middle-ear disease. It is, of course, possible that nasal sinusitis may have had a share in the bronchiectatic group (10 cases), but there is no evidence of this.

On the bacteriological side it seems clear that a variety of infective organisms can cause lung abscess; spirochaetes and other anaerobes are often present, but their specific activity is not proven.

In his discussion on the causation of lung abscess Maxwell remarks on the rarity of tonsillectomy as the causal factor in his series. Only 2 such cases were found, and in both there was septic clot in the jugular vein; both cases were certainly embolic. Recent American figures (Flick, Clerf, Funk, and Farrell, 1929) show 97 cases following tonsillectomy in a series of 167 cases, and this discrepancy between American and European statistics has been frequently noticed. It cannot be due to the use of general anaesthesia, as the great majority of tonsil operations in this country are done under general anaesthesia. It has been suggested that in these cases the route of infection is by the lymphatics rather than by aspiration or by the blood-stream.

The question whether aspiration or embolism is the more common cause is still undecided. Experimental work shows that abscess can be produced by either method in many animals. In man it has been shown by bronchoscopic examination that blood can be found in the bronchial tree in nearly 40 per cent of cases after tonsillectomy, whether the operation has been performed under local or general anaesthesia.

On the whole it seems impossible to decide which is the more common route. Maxwell inclines to the view that post-tonsillectomy abscess is more likely

to be aspiratory, and that abscess after abdominal operation is usually embolic; he does not mention the work of Benjamins (*see* MEDICAL ANNUAL, 1933, p. 496) in which it was suggested that the high incidence of post-tonsillectomy abscess in America was due to the practice of removing tonsils in the more acute stages of inflammation.

TREATMENT.—Maxwell believes that unless the patient is losing ground acute cases are best dealt with by non-operative measures, such as *postural treatment*. If, after two months' treatment, the condition is stationary, further measures are necessary. *Bronchoscopic treatment* is useful for hilar and central lesions, but where the abscess is draining freely into a bronchus postural treatment will probably give as good results.

Artificial pneumothorax should only be used with a central or hilar abscess draining into a bronchus. It should never be used when the abscess is near the pleura. As healing is by apposition of the walls and obliteration of the cavity it is not likely to succeed in chronic cases where the granulation tissue has been replaced by epithelium.

Maxwell advises surgical treatment for peripheral abscesses, especially when they are multilocular. He believes that a two-stage drainage operation is the simplest and the best for routine use. *Pneumectomy* and *lobectomy* are severe and rarely needed. *Thoracoplasty* relieves a small number of chronic cases, but it "has resulted in many disasters—and has all the disadvantages of the artificial pneumothorax in addition to the mutilation attendant upon it, as well as the finality of the procedure."

S. U. Marietta² reports 50 cases of acute pulmonary abscess, of which more than half recovered by medical treatment alone. The essential part of the treatment was postural drainage. Three cases, in one of which the abscess was due to a foreign body, were treated by bronchoscopy. Marietta believes that bronchoscopic drainage should be more widely used, and gives his opinion that some of his cases which required operation might have been cured by bronchoscopy in their earlier stages. He regards the principal indication for bronchoscopic drainage as obstruction by inspissated secretion, inflammatory exudate, granulation tissue, or massive necrotic tissue blocking the draining bronchus.

REFERENCES.—¹*Quart. Jour. Med.* 1934, July, 467; ²*Jour. Amer. Med. Assoc.* 1934, April 28.

LUNG, CARCINOMA OF.

J. F. Gaskell, M.A., M.D., F.R.C.P.

The great increase in the clinical frequency of this condition, and the rapidly accumulating records of series of cases, have directed the literature of the year into two main directions: (1) Inquiries into the reality of the apparent increase with critical summaries of the published records; (2) The possibilities of earlier diagnosis with a view to earlier and perhaps radical treatment by surgery or otherwise.

The Reality of the Increase of the Disease.—The question was raised by R. D. Passy¹ at the meeting of the Associated Physicians of Great Britain and Ireland at the Annual Meeting in Leeds, where he gave a preliminary report of an investigation that he had been organizing and conducting. He gave it as his considered opinion that the increase was only apparent, not real. A very comprehensive review of the literature is given by R. M. Hill² with a critical analysis. He is of the opinion that the increase is partly real, though largely relative. He finds that carcinoma of the lung now forms 1 per cent of all cases that come to autopsy and 8 per cent of all malignant diseases found post mortem. It is a disease of the later period of life, the average age being 51; and the proportion of incidence in males and females is as 7 to 2.

As regards distribution, the various lobes of the lungs are affected with almost equal frequency, with the exception of the right middle lobe, which is very rarely affected alone. Bronchiectasis and pleural effusion are common complications, the latter being ultimately present in more than a third of all cases. The period of survival after diagnosis averages six months only.

Other summaries are those by C. Bowesman,³ who also considers the etiology, diagnosis, and treatment, and describes a series of 11 cases under his own care, and by A. J. Hruby and H. C. Sweany,⁴ who analyse the statistics that they have collected into yearly periods from 1897 to 1930, and show that with a steady increase of about 65 per cent in the general cancer percentage there has been a manifold increase in cancer of the lung, rising to tenfold in 1928. They estimate, however, that the increase in the diagnosis of such cases has also risen from 5 per cent to about 50 per cent in the same period, and that this has brought more cases to hospital and to autopsy. They conclude that an absolute increase is at present not proven. These authors give details of 12 cases of their own. The possibility of a true increase in the incidence of carcinoma of the lung raises the question of the etiology of the disease. The increase in cigarette smoking since the war, and the inhalation of tar particles from modern roads, with the exhaust gases of motor-cars, have been cited as possible causes of such an increase. The increased survival under modern conditions into the cancer age is also quoted by the above authors as a factor in the apparent increase. Hruby and Sweany have analysed a large number of case histories and do not find any relationship to any particular trade or occupation, with the one exception of the well-known very high incidence of cancer of the lung in the miners of Schneeberg and Joachimstal in Bohemia. Bowesman goes into this exceptional case in greater detail. The present view is that the radio-activity of the pitchblende dust of these mines is the most probable factor in causing the high incidence, which is not found in any other type of mine elsewhere. Influenza has also been cited as a contributing cause, with little evidence in support of this.

The recognition of the oat-shaped-cell tumour of the mediastinum as a true carcinoma rising from the primitive basal cells of the bronchial epithelium, due in the main to Barnard, is accepted throughout the year's literature as a potent factor in the apparent increase of carcinoma of the lung, cases formerly designated as mediastinal sarcoma being in reality oat-celled carcinomas. Hill² gives a summary from the literature showing that the most primitive small-cell group is slightly more common than the well-defined squamous-, columnar-, or cubical-cell group. The oat-shaped-cell type is definitely the commonest of all.

Early Diagnosis.—This has been greatly assisted by the advance in X-ray photography of the chest and by bronchoscopic examination. With regard to clinical signs, H. Kahler⁵ emphasizes cough, especially with a mucous or purulent sputum, and breathlessness as early symptoms which may come on very suddenly. With these, stabbing pain in the chest often occurs. 'Raspberry-jelly-coloured' sputum, which has been quoted as characteristic, is very rare; more commonly a sudden definite hæmorrhage occurs. The cough may be like whooping-cough in severe attacks with long intervals. If the growth causes bronchial stenosis, the cough may be ringing in character with respiratory stridor. There may be slight fever. With regard to physical signs, the sudden appearance of small areas of atelectasis, and a shrinking of the side of the chest, with dullness, are very suggestive. This 'shrinking' of the chest is unaltered by breathing, and the dullness is peculiarly resistant to palpation and percussion. Lower-lobe carcinomata frequently first show pleural effusion, which often may be bloodless, and may effectively mask the underlying growth.

Secondary glands are late, but a slight widening of the intracutaneous and subcutaneous veins and a slight local edema of the skin may occur fairly early. According to Frankel, a dilatation of the epigastric vein with a reversal of flow is sometimes an early symptom. Kähler emphasizes the value of such physical signs in cases where X-ray appearances are confusing and simulate other diseases, though he recognizes that in many cases X-ray photography is decisive. The chief difficulty of differential diagnosis is with tubercle of the lung, and absence of a positive tuberculin reaction and of tubercle bacilli in the sputum over a considerable time should always suggest the possibility of carcinoma. E. A. Graham⁶ also emphasizes these early signs and the value of bronchoscopy and X-rays with lipiodol to show up the bronchial tree. H. J. Teschendorf⁷ gives similar early signs, especially emphasizing the cough and breathlessness. He also stresses the similarity of the X-ray picture to that of other diseases in a number of cases, and the masking of the condition which a pleural exudate may cause.

TREATMENT.—At present this is extremely unsatisfactory, and the only hope seems to be in surgical interference, but Graham can only find 6 cases in the literature with survival for a year after operation. Opinion on the value of deep X-ray therapy is conflicting, though all recognize that at present it is only palliative. Teschendorf states that a carcinoma has been observed to diminish in size under intensive deep X-ray treatment.

REFERENCES.—¹*Quart. Jour. Med.* 1934, N.S. iii, 622; ²*Edin. Med. Jour.* 1934, May, 320; ³*Irish Jour. Med. Sci.* 1934, Feb., No. 98; ⁴*Arch. of Internal Med.* 1933, lii, 497; ⁵*Wien. klin. Woch.* 1934, Jan. 19, 86; ⁶*Amer. Jour. Roentgenol.* 1934, xxxi, 145; ⁷*Munch. med. Woch.* 1934, March 1, 313.

A. Tudor Edwards, M.Ch., F.R.C.S.

Cancer of the Bronchus.—The earlier recognition of cancer of the lung is leading to more satisfactory results from operative treatment. It is being generally accepted that even the central carcinomas probably originate in the smaller bronchi and not in the alveolar tissue, and although there have been a fair number of records of successful operation for growths in this situation, it is only recently that carcinoma involving the main bronchi has been successfully subjected to radical operation.

E. A. Graham and J. J. Singer¹ record what is probably the first successful removal of the whole of the lung in a case of cancer arising in the main bronchus. This operation was carried out in a man of 48 years of age. Examination showed obstruction of the bronchus of the left upper lobe. Histological examination revealed a squamous-celled carcinoma in the portion removed at bronchoscopic examination. On exploration of the chest it was found that the growth extended so closely to the bronchus of the lower lobe that it was impossible to save the latter. *Total pneumonectomy* was decided upon and all adhesions were separated. After control of the hilum by a small rubber catheter around it, crushing clamps were placed below and the lung was cut off by a diathermy cautery. The mucosa of the left main bronchus was removed and the pedicle was tied off by a double ligature of catgut just distal to the catheter. Seven radon seeds were inserted into various portions of the stump. Following this procedure a thoracoplasty of the third to the ninth rib, inclusive, was performed, and the pleural cavity drained by an air-tight catheter. The wound healed per primam. A collection of air and pus was found in the extreme upper portion of the bronchial cavity on the ninth day. This was drained through a small stab-wound just below the posterior wound and was later found to communicate with the bronchus. Subsequently, this was replaced by anterior drainage, and followed later by the removal of the

first and second ribs in almost their entire length by a posterior incision. The wound rapidly healed. Four and a half months later the patient was well and had increased his weight by 16 lb. Since that time W. F. Rienhoff² has performed successful total pneumonectomy in two patients for tumours of the left bronchus, one benign and one malignant.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, Oct. 28, 1371; ²*Bull. Johns Hopkins Hosp.* 1933, Dec., 390.

LUNG, SYPHILIS OF.

J. F. Gaskell, M.A., M.D., F.R.C.P.

U. Nuvoli¹ has made a study of the tertiary manifestations of syphilis which may occur in the lung, over a period of four years in Rome. The picture is not a very definite one, its main characteristic being a connective-tissue sclerosis. He states that the pulmonitis alba of congenital syphilis is in the main a diffuse fibrosis which is especially manifested in the peribronchial tissue, where the spirochete is especially aggregated. This region is therefore a site of election for the spirochete. He believes with Arcangeli, following Virchow and Hiller, that similar conditions hold in adults, and that peribronchial fibrosis is by far the commonest manifestation of tertiary syphilis in the lung. His classification is as follows: (1) An early whooping-cough-like form; (2) A chronic bronchitic form leading to emphysema and asthmatic attacks; (3) A gummatous form; (4) Sclerosis of the pulmonary artery; (5) An exudative form, which is a doubtful entity and more probably a combination of (2) with secondary infection.

It is unusual to meet with the early form clinically; the author has only come across seven cases, five of which had positive Wassermann reactions, and in none of these could the anatomical condition be ascertained. At first mild, starting as a simple cold on the chest, it later becomes characterized by an insistent and irritating cough, with paroxysmal aggravation, usually nocturnal. The cough is dry, but there may be a little viscid mucous expectoration. Fever is slight or absent. X-rays show little at first, but later thickening and distortion of the bronchial tree is seen. Specific treatment by neosalvarsan quickly cures the patient, who returns to perfect health but may be liable to relapse.

The chronic bronchitic form is the fundamental syphilitic type and is far more common than is supposed. Out of 213 patients with chronic bronchitis of the emphysematous or asthmatic type, 40 per cent gave a positive Wassermann or Meinecke reaction, 20 per cent gave a weak reaction, and of the remaining 40 per cent with negative reactions many had signs, such as aortitis or aneurysm, of the syphilitic type. The clinical symptoms show no special characters; they start as a slight bronchitis, gradually becoming more severe. Hæmorrhage is most unusual, but a sparse expectoration is present which may later become foul-tasting or foetid owing to the development of bronchiectasis. Finally asthmatic attacks supervene and the patient may die in status asthmaticus, or from cardiac failure with cyanosis, dyspnoea, and polycythæmia due to the obstruction of the pulmonary circulation by the fibrosis. Bronchiectasis and pulmonary gangrene are frequent complications, and the bronchiectatic cavities may be numerous, giving rise to a condition that can perhaps be called syphilitic bronchiectasis. The peribronchial fibrosis has been verified at autopsy in a number of the cases. Changes of a syphilitic nature have also almost invariably been found in the pulmonary arteries. X-ray examination in this group is of the greatest importance, giving a characteristic peribronchial increase most marked at the hilum. Treatment can only cure in the early stages, but is always valuable in arresting the further development of the condition, and diminishing or abolishing the asthmatic attacks.

The gummatous form is rare and is of three types—solitary, multiple, and miliary. The diagnosis almost entirely depends on radiography. The gummata may break down and rupture into a bronchus or fibrose. The solitary form gives a characteristic oval shadow and occurs most commonly in the sub-clavicular regions; it was in this position in three of the five cases observed. An ulcerated gumma may closely simulate a tuberculous cavity. The effect of treatment is the final proof of the nature of such lesions.

The multiple form is usually implanted upon the diffuse fibrotic bronchiectatic type, and is only diagnosable by X rays.

The miliary form was not observed with certainty in the series, but many showed by X rays points of intensification of shadow due to crossing fibres which may perhaps really be the explanation of the miliary form.

Syphilitic disease of the pulmonary artery with calcification goes by the name of Arrilaga, who first described the syndrome. It occurs in the middle-aged and is characterized by intense continuous dyspnoea, cyanosis which is at first transitory but later permanent, and a polycythaemia which may be as high as 9,000,000 per c.mm. Hæmoptyses are frequent and may be severe, also retrosternal pain, vertigo, sleeplessness, attacks of nocturnal asthma, etc. A typical example in the series was a woman with 8,000,000 red blood-cells per c.mm.

Finally, the exudative form is a doubtful entity, but two cases in a man and wife tend to support the existence of this form. They had fine crepitations in the infrascapular region with fever, but no X-ray change. Treatment did not make any difference till neosalvarsan was given, when the temperature rapidly fell and the signs disappeared. The woman was apparently cured, but the man later developed all the signs of syphilitic peribronchitis.

E. Sergent, E. Piot, and J. Imbert,² who also support the view that a syphilitic peribronchitis is a recognizable form of tertiary syphilis of the lung, hold that gummata of the lung are not so rare as is supposed, if regular X-ray examination of the chest is made in syphilitic patients. They describe four types or stages, the solitary gumma, the sclero-gummatous mass, the star-shaped cicatrix, and localized areas of specific bronchopneumonia. Letulle has advanced the thesis that star-shaped cicatrices due to healed gummata can often be found in the lungs of syphilitics at autopsy if carefully sought for; the authors hold that the same is true in life if careful X-ray photographs are taken. The appearances, however, are only suggestive, never specific, and their nature can only be proved by a positive Wassermann reaction coupled with the results of treatment. They describe three cases with a single gumma with rounded shadow disappearing after specific treatment.

REFERENCES.—¹*Políclínico*, 1933, xi, Oct. 1, 649; ²*Presse méd.* 1934, April 21, 641.

LUNG, TUBERCULOSIS OF. (See TUBERCULOSIS, PULMONARY.)

LUPUS ERYTHEMATOSUS. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

TREATMENT.—J. L. Franklin¹ gives a survey of the treatment of lupus erythematosus with gold salts up to date, and an account of 31 cases treated personally by *sanocrysin*. Dosage began with 0.05 to 0.1 grm., and except in a few cases a dose of 0.25 grm. was not exceeded. Courses were of eight weekly injections, followed by a month or two rest. Several courses of treatment were sometimes necessary. Toxic reactions were observed in 18 patients; 2 showed acute dissemination of the disease, 3 exfoliative dermatitis, 7 lesser skin disturbances, 5 stomatitis, and 1 adenitis. The final results show 20 cases cured (64.5 per cent). The author finds that the best results were obtained in patients with the superficial type of the disease and those of

comparatively short duration, but some very gratifying effects were produced in cases of longer standing and of the fixed variety.

A. G. Smith² records the results of 24 cases of lupus erythematosus, 12 of which were treated by gold (*sanoerysin*) and 12 by *bismuth*. Sanoerysin was given in doses beginning with 0.1 gm. and going up to 1 gm. except in those cases which were cured or developed toxic symptoms before this latter dose was reached. Only one patient received more than six doses. Bismuth was given as a compound of quinine and bismuth, *quinby*, in doses of 0.3 gm. weekly, usually in a single course of 12 injections. Of the 12 cases treated by gold, 42 per cent were cured and 25 per cent showed great improvement, while of the 12 cases treated by bismuth 33 per cent were cured and 42 per cent showed great improvement. No toxic symptoms developed in the patients treated by bismuth, but 5 out of the 12 treated by gold showed some toxic symptoms. The author considers bismuth is the metal of choice in the treatment of this disease because: (1) It is less toxic; (2) It does not light up or aggravate an existing visceral tuberculosis, as gold may do; (3) There is not the same risk of severe focal reaction; (4) It can be given with a simple technique to out-patients, without the necessity of in-patient treatment, which is advisable when gold is the preparation used; (5) It is much cheaper than gold.

J. W. Jones and H. S. Alden³ have obtained good results in cases of lupus erythematosus by giving weekly injections of 0.025 gm. of *gold sodium thio-sulphate* (a similar preparation to sanoerysin) subcutaneously. They were trying the method of local injection into the lesions suggested by Monash and Traub, and found that lesions that had not been injected responded as well as those treated. Also they found that patients disliked multiple punctures into the lesions. They therefore gave the drug subcutaneously into the upper arm, and found that the patients suffered no inconvenience and that the lesions responded well.

REFERENCES.—¹*Brit. Jour. Dermatol. and Syph.* 1934, Feb., 66; ²*Ibid.* Oct., 399; ³*Arch. of Dermatol. and Syph.* 1933, Oct., 544.

LUPUS VULGARIS. (See SKIN, TUBERCULOSIS OF.)

LYMPHADENOMA. (See BLOOD DISEASES—HODGKIN'S DISEASE.)

LYMPHOGRANULOMA INGUINALE. (See also GRANULOMA INGUINALE; RECTUM AND ANUS, DISEASES OF.) Col. L. W. Harrison, D.S.O.

This disease continues to excite considerable attention in various parts of the world, as the general impression is that it is increasing in frequency. W. E. Coutts, J. M. Herrera, and F. L. Perroni,¹ of Santiago, Chili, have observed since 1916 a number of cases of "subacute inflammation of both inguinoceural and deep iliac lymph nodes" occurring chiefly in the spring and summer. Such cases have increased greatly in frequency since 1929-30, and in 1930-31 and 1931-32 the number of cases studied by the authors was 82. They share with Gougerot and Cohen a disbelief that all the conditions designated as Nicolas and Favre's disease are one and the same disease. Discussing the American origin of lymphogranuloma inguinale they quote from a description by Father Bartolomé Las Casas of a disease called 'bubas' contracted by early conquerors of the New World from the inhabitants of 'Isla Española' (Haiti); the same description of the disease was given by Ovieda de Valdes in a history of the West Indies published in 1535. They conclude on the history of lymphogranulomatosis as follows: "From the descriptions by the writers of the fifteenth and sixteenth centuries of the different diseases transmitted to Europeans through

sexual intercourse with Indian women of the New World, we arrive at the definite conclusion that not only did they acquire syphilis but also yaws, leishmaniosis, soft chancre, as well as lymphogranulomatosis."

They describe the animal experiments by others and by themselves with material from cases of lymphogranuloma inguinale, but in view of the articles on the subject in the MEDICAL ANNUAL for 1934 (pp. 101 and 287), these need not be summarized here. Searching for evidence of infection in females they failed to find any lesion, and a number of their male cases had for months practised only 'coitus buccalis'. On this they remark, "This last fact, pointed out by us, has also been recorded lately by several other colleagues". Of 250 women presenting no sign of disease, 9 gave positive reactions to Frei's skin test, but none had ever observed any lesion of the external genitals or any adenitis. They believe that females are usually passive carriers, and that "the virus that produces lymphogranulomatosis is of buccal origin"; they attribute the increased frequency of the disease in recent years to the increased frequency of coitus buccalis and cunnilinguism. In this connection they quote a case related by Wehrhein in which the origin could be related to a buccal coitus, and another, by Buschke, of lymphadenitis of the neck in which the initial lesion was on the tongue and was due to abnormal sexual intercourse. They attribute the increased frequency of "those undefined chronic inflammations and strictures of the rectum, hard infiltrations of parametrium, etc., just recently allied to Nicolas-Favre's ganglionic syndrome (Jersild, Nicolas Favre, Massia and Leveuf)" to increase in the practice of anal coitus. They quote Sèneque as having established a definite relationship between certain of these cases and sodomy. In their description of the symptoms they lay stress on the constancy of arthralgia but infrequency of arthritis; when this does occur its onset is sudden, and it soon departs with the same rapidity. Their experience with the Frei skin test is that it is not constant, and for this reason they repeat their view that "Nicolas and Favre's disease includes cases that differ from the classical description made by these authors".

W. E. Coutts² discusses genito-ano-rectal lymphogranulomatosis on the basis of 7 cases in the male (most authors have studied the ano-rectal syndrome in women), and concludes that the condition occurs in men in two forms: one that begins with abscesses and fistulae in the perineum, and the ano-rectal symptoms appear some years afterwards, the other where the fistulae follow a rectal stricture. He thinks that the port of entry in the first form is the posterior urethra, and that in the other it is the anus or rectum. In 4 of the 7 cases studied personally by the author 2 were examples of the first form and 2 of the second form. All 4 gave positive Frei reactions and positive reactions to a complement-fixation for lymphogranuloma which has been devised by the author. This test is reported on in a preliminary note by W. E. Coutts, F. L. Perroni, and J. Martini,³ who made a watery extract of pus from a case of lymphogranuloma (1 c.c. pus in 30 c.c. of a 0.5 per cent solution of phenol in physiological saline) and used it as antigen in a strength of 1 per cent. In complement-fixation tests with this extract 13 out of 15 cases of lymphogranuloma inguinale were positive, while 10 syphilitic sera were negative.

H. N. Cole,⁴ in an excellent account of lymphogranuloma inguinale, mentions as occasionally seen: generalized enlargement of lymph nodes, enlargement of the spleen, swelling of joints, and even a general polyarthritis. He says also: "General skin manifestations such as erythema nodosum and erythema-multiforme-like eruptions, urticaria, and scarlatiniform eruptions" have been noted by various authors. He comments on the absence of symptoms in some women who have conveyed the disease and then discusses with illustrations the ano-rectal syndrome known as esthiomène which was reviewed

in the MEDICAL ANNUAL for 1934 (p. 288). He gives evidence in some of his cases that the reaction to Frei's test may persist throughout life. With regard to treatment, he deprecates total extirpation of glands because it results in elephantiasis, but speaks well of partial removal. After reviewing the various other forms of treatment, Cole says: "In my estimation, rest in bed, promotion of free drainage, perhaps along with partial extirpation of the nodes involved, and the use of solution of antimony and potassium tartrate intravenously gives the best results. Naturally, the results in none of the cases of esthiomène and of anal stricture are particularly good."

T. Anwyl Davies and A. King⁵ report on three cases of lymphogranuloma inguinale in two of which the primary lesion was on the external genitals and in the third it was intra-urethral; one of the cases is stated to be the second in which the disease was contracted in Great Britain and the diagnosis confirmed by animal experiments. The intra-urethral primary lesion appears to have been diagnosed as such on the strength of "an abacterial urethral discharge of thin milky fluid".

E. Wassén⁶ has found that, if emulsion of brain of a mouse infected with virus of lymphogranuloma inguinale is inoculated into the skin of the abdomen of a guinea-pig, a red papule appears in twenty-four hours, increases to a maximum of 6 by 8 to 12 by 15 mm. during the next two days, necroses in the centre during the week, and gradually resolves during the next three or four weeks. The development of the lesion can be prevented by mixing with the mouse-brain emulsion an equal quantity of blood serum of a patient suffering from lymphogranuloma inguinale. The mixture is allowed to stand for one hour at 37° C. and for sixteen to eighteen hours on ice before being injected into the guinea-pig. Thus the fact of a patient's blood serum having this preventive action would be valuable evidence in the diagnosis of lymphogranuloma inguinale.

Some connection between lymphogranuloma inguinale and the Waelsch type of urethritis [from the description this appears to be identical with the disease known to V.D. specialists in this country as sago-grain urethritis—L. W. H.] seems to be suggested by the discovery of W. Frei, J. Wiese, and F. Klestadt⁷ that the secretion from the urethra in Waelsch urethritis when made up as antigen for a Frei skin test provokes in cases of lymphogranuloma inguinale reactions similar to those provoked by ordinary Frei antigen. On the other hand, cases of Waelsch urethritis do not react to the Frei test. R. Bezeny,⁸ after quoting these results and some by Kalz, reports some experiments of his own with secretion from a case of Waelsch urethritis injected intracutaneously into five cases of lymphogranuloma inguinale. Four of the five gave positive reactions and the fifth was one which gave only a weak reaction with Frei's antigen. Twelve control cases were negative. Bezeny thinks the explanation lies in a relationship of Waelsch urethritis to lymphogranuloma inguinale, though he is convinced that the two diseases are not due to the same cause.

REFERENCES.—¹*Amer. Jour. Surg.* 1933, xxii, No. 1, Oct., 96; ²*Ann. of Surg.* 1934, xxii, Jan., 188; ³*Dermatol. Woch.* 1934, xcvi, 558; ⁴*Jour. Amer. Med. Assoc.* 1933, ii, 1069; ⁵*Lancet*, 1933, ii, 289; ⁶*Comptes rend. Soc. Biol.* 1934, cxvi, 121; ⁷*Klin. Woch.* 1932, No. 51, 2114; ⁸*Med. Klin.* 1934, xxx, 121.

MALARIA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY AND PROPHYLAXIS.—The transmission of quartan malaria infection by *Anopheles elutus* has been investigated by G. Mer,¹ who found the salivary glands infected twenty-eight days after feeding on a malarial case at a temperature of 23° to 26° C., and three human beings were infected by their bites. L. W. Hackett² deals with the sub-species of *A. maculipennis* of European

countries, and he describes six varieties distinguished by significant and constant characters of their eggs. Two do not bite man, so are of no etiological importance; two more only occasionally feed on man rather than on animals; and the remaining two, *A. labrunchiæ* and *A. clutus*, continually invade human houses, so are important as malarial carriers.

IMMUNITY.—This interesting subject has been discussed by several workers. I. J. Kligler and G. Mer³ report that in hyperendemic areas children show a decreased intensity of infection after 4 years, but the incidence among them only begins to decrease after the age of 6. The efficiency of drugs should therefore be tested in children below the age of 6, and the control of malaria by treatment will depend on the sterilizing effect of treatment on such young children. Edm. and Et. Sergent and others⁴ distinguish between a true immunity and a tolerance to a chronic infection, and illustrate their point by animal infections. C. A. Gill⁵ also refers to this point and emphasizes our ignorance of the true nature of malarial immunity. M. Ciuca, L. Ballif, and M. Chlearescu-Vieru⁶ report on the development of immunity among 2061 inoculated with malaria for the treatment of nervous affections in Roumania in a malarious area, which allows of a study of development of immunity after repeated artificial infections. Among 1198 B.T. inoculated patients, only 50 per cent had fever and parasites in their blood after the first inoculation, 16 per cent became temporary carriers, and 34 per cent were immune. After the third inoculation 86.7, and after the fourth 100, per cent were immune, even to a transfusion of 150 c.c. of virulent blood on twenty-five bites of infected mosquitoes. In 322 quartan infections 36 per cent were immune to the first inoculation, and the rate rose steadily to 100 per cent after seven inoculations. In 544 malignant tertian cases only 22 were originally immune, and the proportion rose more slowly to 97 per cent after ten inoculations. Immunity to one variety of malaria did not protect against another form, nor was it diminished by infection with a new form. The authors do not consider that the pre-munition theory of Sergent is able to explain the mechanism of immunity in all cases. H. Stott⁷ records some observations with drawings he made showing the phagocytosis of malarial parasites in various stages of development by large mononuclear cells, which he regards as a part of the process of the production of immunity. J. Lowe⁸ reports on the course of untreated cases of malaria in leprosy patients with a view to watching the natural cessation of the fever. In 11 B.T. cases spontaneous arrest of fever took place within two weeks with only two relapses; in M.T. cases a similar proceeding is not safe.

EPIDEMIOLOGY.—W. J. Vickers and others⁹ discuss economy in large-scale antimalarial measures in Malaya, where oiling is still considered the best plan, and a 'brush-spray-mop' method of its application is described which showed an economy of at least 50 per cent in cost. R. Mackay and others¹⁰ record an outbreak of arsenical poisoning following the use of Paris green as a larvicide in water used for domestic purposes at Dar-es-Salaam. J. Schwertz and M. Peel¹¹ examined the incidence of malaria among negroes in childbirth in the Belgian Congo and found the percentages of infection to be 68 and 74 respectively in the peripheral blood and the placentas of the mothers, and 6 and 3.6 respectively in the cord and peripheral blood of the newly-born infants, so they regard congenital malaria as very rare and unimportant as compared with infection after birth.

E. D. W. Greig and others^{12, 13} report on Henry's melano-precipitation serological reaction in malaria, using melanin pigment extracted from human hair by hydrolysis with HCl after dialysing through a collodion membrane, with more satisfactory results than with suspensions of ox choroid membrane. The same method of diagnosis is dealt with by F. Meersseman and P. R. Lacour,¹⁴

and they report 100 per cent of positive results in relapsing cases of malaria appearing after eight or nine paroxysms of fever, and in chronic malaria 90 per cent reacted, but in old cases with occasional attacks some time back reactions were much fewer. Among 244 tests in non-malarial subjects, positive reactions were met with only in one case of syphilis and in three of hæmolytic jaundice, so the reaction is of considerable diagnostic value. E. Appelbaum and B. G. Gelfand¹⁵ report a series of cases in which malarial infection was certainly or probably conveyed in the case of diacetylmorphine addicts by the use of the same syringe by a number of patients without disinfection, and no fewer than 6 of the 10 cases died of the malaria so induced.

The following work has appeared in the Records of the Malarial Survey of India during the last twelve months. W. C. Sweet and B. A. Rao¹⁶ report on the control of malaria in the Mysore States, where they applied Paris green to the dangerous anopheline breeding places weekly and gave two tablets of $\frac{1}{2}$ gr. of plasmoquine and 1 gr. of quinine twice a week to adults, and one tablet to children, with beneficial results. The cheapest control was obtained in Bangalore City at a cost of halfpenny per head, or under 1 per cent of the receipts of the municipality. J. A. Sinton and H. W. Mulligan¹⁷ deal fully (with a valuable list of references) with mixed and superinfections of malaria in the lower monkeys, and they show that *Plasmodium knowlesi* predominates in *S. rhesus*, and *P. inui* (var. *cynomolgi*) is the 'Cercopithecus type' of parasite. J. A. Sinton¹⁸ advocates the standardization of mixed preparations of cinchona alkaloids on the lines of totaquinine to provide a cheap and effective mass treatment of malaria in India, and points out that it should contain a large proportion of the total crystalizable alkaloids and a small proportion of the more irritant and nauseating amorphous ones. G. Covell and J. D. Baily,¹⁹ in a report on malaria in Sind, record a hyperendemic area in the rice-growing regions, and consider that the disease already shows signs of increase on account of the Sukker barrage irrigation works. R. Senior White and A. K. Adhikari²⁰ obtained no lasting reduction of adult or child malarial incidence by an attack on the gametocytes just before the commencement of the malarial season.

DRUG PROPHYLAXIS AND TREATMENT.—Through experiments on nervous diseases treated by artificially induced malaria it was proved that prophylactic quinine, given with a view to prevent malarial infection, does not in fact prevent infection by the sporozoits injected by a mosquito, so is not a true prophylactic; yet it may kill the parasites before they can multiply sufficiently to produce clinical malaria, or cause it to be a much milder infection, and thus may be of great benefit. A comprehensive test of the value of *prophylactic quinine* in highly malarious stations in the Punjab with British troops resident in them, for the purposes of reducing the harmful effect of the autumn malarial outbreaks among the men, is recorded by T. Young²¹ with the following results. During the three years' duration of the test there was a uniformly lower malarial rate throughout among those taking prophylactic quinine, although it was only given for two periods of three weeks, with an interval of ten days between them, in doses of 10 gr. of the sulphate daily with the exception of Saturdays, when a purge was taken. In the case of soldiers on the march two 5-gr. tablets of quinine bihydrochloride were used, as it is more readily absorbed. No evidence was obtained that this use of the drug increased in the slightest degree the difficulty in finding the malarial parasites in those who became infected in spite of it or the subsequent treatment of the disease, nor were any other disadvantages met with. Plans were made for a similar controlled experiment on a much larger scale on about 30,000 men, but this was forbidden by 'higher authority' on the grounds that the case for quinine prophylaxis had been completely proved. Many of the attacks took

place after the preventive quinine had been stopped, so the results would probably have been still better if the doses had been continued longer until the brief autumn Punjab malaria season was quite over.

S. P. James²² records an instructive test of the power of quinine, plasmoquine, and atebirin respectively to prevent infection of mental patients with benign tertian malaria through the bites of infected *Anopheles maculipennis* when given for six days previously in doses of 15 gr. of quinine, six tablets of 0.1 grm. atebirin, and three tablets of plasmoquine respectively. Two control patients developed malaria after incubation periods of ten and twelve days, all five on quinine got the disease in ten to fourteen days, and all five on plasmoquine became infected in ten to eleven days, but none of the five on atebirin showed any signs of malaria, so that drug alone proved to be a true prophylactic. A trial of atebirin prophylactically is also reported by Soesilo²³ at Batavia in 22 volunteers, with 11 controls, using the more dangerous *P. falciparum* conveyed by the bites of mosquitoes infected from a crescent carrier. Thick blood-films were examined for parasites daily before and for twenty-one days after the bites, and five further weekly examinations were made. The atebirin was given five to twenty-four hours before the infective bite, and for four to six days after in maximum doses of 200 mgrm., although some received only 100 mgrm. The result was that 10 out of the 11 controls developed malaria in ten to fourteen days, and 6 of the 21 who received the full course of the drug also got fever in twelve to twenty-four days, and the 15 who escaped infection were shown to have remained free up to eight months.

Atebrin has been further reported on by several observers. In Calcutta R. N. Chopra and B. M. Das Gupta²⁴ discuss its action on Indian strains of malaria with very similar results to those of earlier workers. They found it effective against the asexual forms in all three types of malaria, and against the sexual forms of B.T. and quartan, but not those of M. T. malaria. It can be given intravenously, but better intramuscularly in severe cases, and it reduces the size of the spleen rapidly. The writers also agree with recent workers that relapses occur after its use, and it is safe in blackwater fever. It is mainly excreted in the urine, where it can be readily detected. Its price is at present too high for general use in India. They found it had less action on the pregnant uterus of laboratory animals than quinine. It was most effective in severe monkey malaria, though a relapse may occur after some time, but this is amenable to a single further dose of atebirin, which is more effective than quinine in these animals. R. Row and others²⁵ also found atebirin rapidly effective in removing the parasites from the blood in monkeys; repeated relapses were liable to occur ten days after it was left off, but yielded again to the drug. Relapses also occurred after quinine and plasmoquine.

The third general report of the Malaria Commission of the Health Organization of the League of Nations dealing with therapeutics has been discussed and abstracted in India and in South Africa.²⁶ The following are some of the more important recommendations. No standard treatment can be advised, as the types and degrees of severity vary so widely in different areas. None of the three drugs most used are true prophylactics, as they fail to avert mosquito infection, but clinical prophylaxis in maintaining the infection at a sub-clinical level may be obtained by long-continued daily doses of not less than 6 gr. of quinine, or possibly by atebirin. In the treatment of malarial attacks the Commission advise atebirin in M.T., and either that drug or quinine in other forms, and recommend only five to seven days' continued treatment, after which relapses should be awaited and treated so as not to interfere with the production of immunity. They do not favour the common combination of quinine and plasmoquine, and only advise the latter after cessation of fever

to act on the sexual stage of the parasites, especially in children, whose blood shows a far larger number of gametocytes than in adults, and are thus the main source of the spread of malaria through mosquitoes. They refer to 'recurrences' as taking place seven to ten months after the primary attack. As the editor of the *Indian Medical Gazette*²⁷ remarks, the recommendations of the Commission appear to be based much more on a few experiments in Europe on artificially induced malaria than on the vast experience of the naturally occurring disease in the tropics.

The effect of removing the spleen on monkey malaria is reported on by K. V. Krishnan²⁸ and others based on 30 operated on and 45 control animals, with the result that the disease was found to be much more severe and difficult to treat in the spleenless animals, so they think the reticulo-endothelial system is of great importance in malarial immunity.

In the Sudan L. Henderson^{29,30} reports that after a five-day course of 0.3 grm. of atabrin, with 0.03 grm. of plasmoquine daily, relapses occurred in malignant tertian, but not in benign tertian or quartan malaria, but similar eight-day courses were also successful in M.T. cases. On the other hand, P. B. Manson-Bahr and A. H. Walters³¹ consider that atabrin and plasmoquine have a selective action on M.T. malarial parasites. Atabrin treatment is also dealt with by E. J. R. MacMahon³² working in Malaya. He considers the drug to be an improvement on quinine as it has no unpleasant effects, except the harmless yellow staining of the skin, and abdominal pain in 12 per cent of the cases, easily relieved by diet and alkalis. Five days' treatment with a total of 1.5 grm. clears up cases, and relapses were reduced from over 60 per cent after a longer course of quinine to somewhat over 43 per cent.

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MALTA FEVER. (See UNDULANT FEVER.)

MEASLES.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—In a paper on *measles in newborn infants*, J. L. Kohn¹ records eight cases of children infected by their mothers. The ages at the time of onset in four cases were 14, 15, and 30 days, and 10 weeks respectively. In two cases therefore the mother was incubating measles at the time of the child's birth.

J. H. Veslot² states that in large towns the children of women who have had measles have transmitted to them by the placenta a passive immunity which is almost absolute during the first two months of life, relative between the third and sixth month, very slight between the sixth and ninth month, and practically nil from the ninth to the twelfth month. During the first year of life abortive forms of measles are frequent owing to inherited passive immunity, the influence of age, and cachexia. Congenital measles is rare. Its clinical

cause is variable, and the prognosis is usually bad. Bronchopneumonia is a very frequent complication, occurring in from 24 to 51 per cent in different epidemics. Digestive disorders are chiefly found in children who are artificially fed. Otitis at an early or late stage occurs in about 25 per cent. Measles encephalitis is very rare during the first year of life. The association of measles with diphtheria is very frequent in infants in a hospital environment, rhinitis being the usual form. Measles has an undoubtedly aggravating effect on tuberculosis in the course of the first year, and tends to give rise to generalized miliary tuberculosis or tuberculous bronchopneumonia. The average mortality from measles in the first year of life at the Hôpital des Enfants Malades, Paris, from 1927 to 1932 was 43.58 per cent, being higher in boys (52 per cent) than in girls (34 per cent).

K. L. Olwin and E. L. Turner³ report three cases in children aged from 3 to 7 years of *acute oedema of the larynx*, which is a rare complication of measles. In all three cases the oedema developed several days after appearance of the rash and not in the prodromal stage, as in most of the cases on record. Tracheotomy was performed on all, with the result that two recovered and one died.

E. Mayerhofer⁴ describes two forms of *prodromal measles angina*, viz., an early form, which is rare and occurs four to eight days after infection, and a late form which develops on the ninth to twelfth day of the incubation period, but always before the appearance of Koplik's spots. Prodromal measles angina is probably an allergic reaction affecting the lymphatic system of the buccal cavity analogous to the angina which accompanies vaccination, serum sickness, leukemia, and agranulocytosis.

J. L. Kohn and H. Koiransky⁵ record their observations on 59 children aged from 1 to 10 years in whom *skiagrams of the chest* were taken in various stages of measles in the lateral as well as in the antero-posterior positions. In the lateral position enlargement of the lymphatic glands localized in front and below the bifurcation of the trachea and occasionally of those in the posterior mediastinum was found in almost every case, the maximum enlargement being most frequently seen at the height of the eruption. In the lateral position 11 cases showed evidence of pleural involvement. In confirmation of their previous observations the writers found that pulmonary infiltrations, enlarged hilar shadows, increased intensity of the pulmonary markings, and pleural changes were frequently present in mild as well as in severe cases. Only 4, however, of 17 patients who had been given immune serum after exposure to measles showed pulmonary infiltration, but enlarged hilar shadows and increased intensity of the pulmonary markings were found in the rest.

M. G. Peterman and M. J. Fox⁶ report 13 cases of measles complicated by *encephalitis* in children aged from 13 months to 8 years: 9 were boys and 4 girls. In 12 the onset occurred between two and six days after appearance of the rash, and in 1 eight days after. In all but one in which the onset was characterized by restlessness and convulsions the encephalitis began with drowsiness or stupor. Six patients had a rectal temperature of 99.4° on admission. The physical signs were nuchal rigidity in 5 cases, Brudzinski's neck sign in 3, and a diversity of other neurological symptoms which often varied from day to day. Eleven patients in whom the blood was examined showed a polymorphonuclear leucocytosis varying from 12,000 to 26,000 leucocytes per c.mm. All the spinal fluids were clear, and 7 were under increased pressure. The cell-count ranged from 5 to 380, of which from 40 to 98 per cent were lymphocytes. The globulin was positive in 6 of the 11 fluids so tested. The sugar ranged from 71 to 125 mgrm. per 100 c.c. The Wassermann reaction was negative in all.

G. Stancanelli,⁷ who examined the *blood* of 9 infants with measles, aged from 5 to 12 months, found that during the incubation and prodromal periods there

was a diminution of hemoglobin and of the red corpuscles, while there was a gradual increase in the white cells during the eruptive stage. On the occurrence of complications leucocytosis was frequent; myelocytes and metamyelocytes were often seen in the prodromal period and subsequently until recovery took place. There was a shift to the left in Arneth's scheme in the prodromal and eruptive periods and during the presence of complications.

PROPHYLAXIS.—According to Sir George Buchanan⁸ convalescent serum has been used at the Hospital for Sick Children, Great Ormond Street, since 1925, but it is only recently that it has been used on a larger scale in other London hospitals. In 1931-2, during an epidemic of measles in London, an investigation was made under the auspices of the London County Council as to the value of *convalescent and adult serum* for the protection of contacts. Of 2220 children 680 were given convalescent serum and 1333 adult serum, while 207 did not receive any preventive injection. Of the last group only 25.1 per cent did not develop measles, whereas 90 per cent of those who had convalescent serum, and 76.7 per cent of those given adult serum, escaped an attack. Of the inoculated children only 3 per cent had an unmodified attack, as compared with 70.5 per cent of those that had not been inoculated. The doses of convalescent serum were 10 c.c. for children under 3 years when complete protection was required, and for older children 1 c.c. for each year multiplied by four. In such cases the serum was given during the first five days after exposure. When the serum was given after the fifth day, or when the dose though given within the first five days was reduced by half, more than half the contacts had a mild or abortive attack. During the last four years an exclusive use has been made at Birmingham of adult serum, which is made available by the Health Department for any practitioner who needs it. A similar use of convalescent or adult serum is made in the hospitals at Liverpool, Manchester, and Brighton.

M. Chandler⁹ states that the results of prophylaxis of measles by convalescent serum during the last ten years at the Hôpital des Enfants Malades have been as follows: absolute prevention in 75 per cent, attenuation in 20 per cent, and failure in only 5 per cent.

A. Winiecki¹⁰ states that the employment of the blood of the mother who has had measles is an easy, harmless, and effective method for the protection of the child. The technique is very simple, no anticoagulant being required. The blood is taken from the mother's arm vein and injected intramuscularly into the child in doses varying from 10 to 35 c.c. Of 17 cases recorded by Winiecki, 10 escaped measles altogether and 7 had only a mild attack.

TREATMENT.—M. P. Borovsky and F. Steigmann¹¹ report their observations on 194 cases of measles, one-half of which were treated by *amidopyrine*, while the other half served as controls. The results were as follows: the morbidity, duration of fever, and complications, were about equal in each group, and the drug did not prevent the appearance of the rash.

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MEDICINE IN AN INDUSTRIAL STATE. Leonard P. Lockhart, M.D.

Some Effects of Industrial Development.—Advances in scientific knowledge when applied to production or to distribution inevitably cause alterations in existing occupational conditions. There may be more or less employment resulting in a particular trade or trades, or considerable modifications may take place in the working environment. These effects of applied science have always

been evident, no matter how primitive the science or how hesitant the application of it. The so-called Industrial Revolution was a phase of *laissez faire* application which unfortunately got out of hand to such an extent that many generations will be called upon to repair the physiological and psychological damage suffered by large sections of our population.

Scientific developments within the last twenty-five years have been such as to cause many new industries to arise, supplying us with entire ranges of novel products, many of which have profoundly altered social and political life; yet all give rise to problems which affect both producer and consumer. These problems, which may bear little or no relationship to the economic value of the product, may, however, have direct concern for clinical and preventive medicine.

The nexus between health and occupation is not always easy to discover, for effects do not always manifest themselves at once nor do they necessarily bear much superficial relationship to the work. They are not always chemical or physical. Psychological effects have of recent years assumed a very large place in the studies of industrial medicine, and these, too, are often quite indirect. In many cases the production of an article, such, for instance, as radio sets or motor-cars, or the entire transformation of apparently settled occupations, such as male bank-clerking following on the introduction of girl-operated machines, may have repercussions on the social structure which affect not the occupation of the worker so much as the economic environment in which he or she lives. Individual circumstances determine the manner in each instance.

There is direct causal relationship between wool-sorting and the malignant pustule of anthrax, between hard headings in coal mines and silicosis, and between lead painting and plumbism, though in the latter instance it took Sir Thomas Legge many years first to convince himself and then to convince others which part of the process was responsible. Doctors see these conditions, certificates are signed, and the law, through the instrumentality of the Workmen's Compensation Acts, is set in motion. There the matter is too often allowed to rest, presumably on the assumption that it is only the physical or chemical effects of occupation that are pathological. The wider psychological influences are ignored. These pass from direct cause and effect, as in the case of certain temperaments in specific occupations resulting in the occupational cramps, to nervous disorder resulting from indirect emotional or economic causes. Too often physical phenomena in the immediate vicinity of the patient are indicted while the true chain of evidence is unexplored.

Given common sense, proper apparatus, care, and knowledge, the direct specific hazards are well on the way to being conquered. It is hardly too much to say that, accident or justifiable ignorance excepted, they should not occur. This is true, for instance, of the bulk of occupational dermatitis, gas poisoning, plumbism, and the respiratory hazards.

The Doctor's Concern with Industry.—Has the doctor of the immediate future no concern, then, with industry? On the contrary, industry is going to make increasing demands on medicine. In the first place, the existence of a new hazard is often brought to light owing to the vigilance of a general practitioner who, being unsatisfied that he has explained a certain illness, probes the matter till a chain of evidence is established. Hence the importance of an accurate knowledge of every patient's occupation. Secondly, a knowledge of the principles of routine protection is necessary, for advice may at any time be sought from a doctor on this point. Thirdly, a study of the wider significance that modern industrial technique has acquired for medicine is essential.

Attention must be turned to the industrial worker no longer merely as a man or girl operating a process but as an individual trying to live his life in a system which is the direct result of applied science. There are two aspects of this which, though distinct, are intimately connected. We must look for any effects that are likely to influence health for better or worse, and we must also study the system in order to discover what opportunities exist in it which are novel and which can aid us in solving the very real problems that beset man in the modern industrial state. There is evidence of both. Particularly shall we find that the opportunities are not only numerous but far-reaching.

The medical officer of an expedition has more to consider than the accidental hazards of the journey. Men not only go sick from a variety of causes, but they ail and recover at different rates under differing conditions. Short of overwhelming disaster, the doctor who will bring his men back in the best fettle is he who serves an expedition where the morale is highest, the economics soundest, and the leadership best. The analogy serves equally well when considering people working their way through the intricacies of industrial life, remembering in parenthesis that agriculture is still our largest industry and that factory conditions are penetrating rapidly into it.

A doctor's first task is to cure the sick, and therefore it is necessary to discover every ascertainable factor in etiology, not confining ourselves to the major conditions but paying great attention to the so-called minor ailments which, though they do not necessarily confine the patient to bed, take a very heavy toll in lost time, lost wages, and depleted savings. There are thousands suffering with disorders of function who, though not actually incapable of work, are rendered unfit to live their lives to the full, and who radiate from themselves an influence which is particularly harmful to the young. It is by no means true that these conditions are necessarily due to a physical pathology, nor is it correct to assume that a physical disability continues for the full run of a period of incapacity. The physical merges into the psychological, and in many instances is entirely subordinated to it. That any but a negligible minority actively malingers is against the weight of the evidence.

The problem of sick absenteeism has been referred to elsewhere¹ and it is not proposed to recapitulate the arguments here, but on any reasonably representative sample of the industrial population it can be shown with little fear of contradiction that temperamental tendencies can be touched up under modern conditions not only by a great variety of situations but on a sufficiently large scale to produce a health problem of considerable magnitude. That a very large proportion of disorders of function are of temperamental or emotional origin seems incontrovertible.

Social Tendencies.—The three salient features of the modern industrial state are interdependence, specialization, and centralized control. Production and distribution are equally affected. Interdependence is often masked during phases of comparative prosperity; specialization is often carried to lengths that deprive the specialist of vision; and central control tends to undergo a process of devolution. Granting these qualifications, the generalization is true of modern developments under all forms of political control. Can it be that medicine is to remain immune from tendencies so implicit in most other social functions? It would appear impossible. Therefore, remembering Pasteur's words that "the only way of seeing things rightly is seeing the whole of them", and realizing how destructive of this ideal specialization can be, we are forced to accept the idea of team-work while doing our best to avoid its inherent drawbacks.

The 'team' in medicine as generally understood is within our own profession, but so soon as we admit the importance of psychological factors arising from

industrial and economic factors in the production of ill health, the team becomes enlarged and embraces educationists, economists, industrial administrators, and government officials. It demands much from us, for it reduces us to being a part rather than the whole. On the other hand, medicine finds itself called on to participate in functions hitherto outside its accepted sphere, and statesmanship in all its branches becomes nearly as important as the bedside. Until quite recent times the doctor's function began when the patient was either about to be born or to be sick, and ended with cure or death. To-day it is different. In addition to treating the sick and controlling confinements doctors, generally under some form of public administration, carry out a number of public or quasi-public duties. The school doctor, for instance, a full-time public servant, supervises and in many cases treats children from 5 to 14 years. After an interval of two years the private doctor assumes responsibility, but under new conditions.

There are, however, others in the field, all performing special functions. The public makes increasing demand for hospital treatment, and after a period of several hundred years of voluntary work the State and the Local Authority have stepped in and have established municipal hospitals, sanatoria, convalescent homes, and special treatment centres. Industry, realizing its own particular problems, retains or employs medical men and women to perform duties which vary from mere inspection up to highly organized clinic services.

In addition to this the State maintains an industrial medical service of its own. It is therefore possible for an individual before attaining the age of 21 years to have been under the care of at least a dozen different medical systems. In itself this is neither good nor bad. It entirely depends on the degree of co-operation between the different services. On the whole, co-operation is rather conspicuous by its absence. Whether industrial rationalization is good or bad is in the same case. It depends on the degree of co-operation. But rationalization was forced on industry by economic pressure not by political expediency, and rationalization is being forced on medicine for the same reason. Were we to rationalize medicine on a co-operative basis embracing merely the existing medical services, we should still be behind the times, for our educationists and industrial administrators would be outside it. Hence we must not only elaborate a new administrative technique but admit to it many who have hitherto been regarded as quite external to our affairs. And all this is because applied science has created a new economic state within which new pathological factors and new psychological problems have arisen and a reorganization of social life is taking place coupled with a redistribution of wealth.

The Worker who is Sick.—Given the case of an industrial worker suffering from, say, gastric pain or cardiac symptoms, consulting his panel doctor for the first time at the age of 25, can the doctor from his own observations deal with this unaided? In the long run he may, but to do it quickly with the least demand on his own time and the least loss of time, wages, work, and efficiency to his patient it seems probable that he needs information which he cannot supply for himself. In the first place, what is the patient's medical history? Who has it and where can it be obtained? In many instances no one has it and it is unobtainable. The patient may say he had rheumatic fever or enteric fever as a child, but it is not at all certain that the statement is correct, and it may easily prove a red-herring across the trail. He may have been at a special school and the medical or psychological reason behind this may be of importance in subsequent diagnosis.

Any one of the various medical men who have had dealings with the patient may have useful facts concerning him duly filed and docketed, and though it may often be unnecessary to refer to them they ought at least to be readily

available should the practitioner desire it. This applies particularly to hospital records and to school medical records. The admirable methods employed in some districts are by no means universal, and a more up-to-date system would obviate the irritating reply that the notes have been lost or are incomplete. Anyone may reasonably suppose that a hospital or school medical service could supply notes, but it is only just beginning to be realized that valuable information can be gathered from quite another source.

The aggregation of industry into large units is making possible the institution of industrial medical services on a scale of considerable social importance, and these can materially assist the private practitioner in his work. Such services are not yet numerous, but they are growing, and as time goes on it seems inevitable that they will assume a very large place in our scheme of medical care and supervision. Some employers, including government departments, lack vision when they start such a scheme, but equally a large number of doctors who often undertake the work on a part-time basis fail to realize and press their opportunities.

Two main considerations must apply if the scheme is to be of public as well as private benefit. In the first place, the clinic must undertake in co-operation with the private doctor the treatment or after-treatment in any case where treatment and occupation can be run together. The saving in lost time to the worker is enormous. Secondly, except in cases of occupational illness or accident, the information in the clinic must be absolutely confidential. When these two considerations apply a wealth of data can be accumulated which can be passed over to the private doctor when he desires it, provided of course that it is needed for purposes of treatment and will not be used against the interests of the patient in, say, life insurance work.

To return to our hypothetical case of cardiac or gastric disturbance. These and many other symptoms are connected with a high degree of correlation with emotional and temperamental maladjustments in the economic environment. The degree of disturbance depends largely on the individual temperament, and this in itself requires patient and careful investigation; but unless the investigator knows the working environment intimately, and knows all the other people or factors concerned, he cannot arrive at anything like a correct solution. In working out the details of each case a great deal comes to light regarding the home, marital, and extra-occupational circumstances of the patient. When, as often occurs, one of these people goes sick or seeks the advice of his own doctor, the industrial doctor can supply details which may, and indeed often do, lift the whole thing out of the field of the physical and place it in its correct position in the psychological sphere. This, again, raises another point, for it makes it desirable to know something concerning the patient's early development, and often prompts a reference to the school records both medical and educational.

Preventive Medicine in Industry.—On the preventive side one learns in an industrial practice to view very seriously the adjustment of the individual to his or her job in life. The practical difficulties are great, but they are vastly easier to deal with where one can watch events over a period instead of having to make a 'spot' diagnosis as the result of an empirical test and then trust to luck. So many tests designed to fit square pegs to round holes are based on the assumption that intelligence is the factor most necessary to measure. Apart from the fact that temperament is generally far more important, there remains the undoubted fact that psychological tests divorced from clinical data are often extremely misleading. This point is brought out clearly in the recent report to the Minister of Labour by the National Advisory Councils for Juvenile Employment. The value of the school medical records is emphasized very strongly in the report.

Fatigue, though in many cases responsible, is given a far more prominent place in the etiology of industrial ill-health than the facts warrant. Boredom, monotony, psychical over-stimulation, improper feeding, domestic worry or hardship, and temperamental unsuitability must also be considered, and the condition is not cured but often made worse by enforced 'rest'. What is needed is often a readjustment of emotional outlets and even in many cases merely some insight by the patient into his own psychological make-up. It is interesting to see how many patients with symptoms or disabilities which baffle both the private and industrial doctor independently resolve themselves rapidly when the two work in co-operation. 'Medicine and duty' acquires a new significance when the 'medicine' is directed towards emotional and temperamental re-adjustment based on knowledge of the domestic, occupational, and inner life of the individual.

The preventive side of industrial work is helped very greatly when some form of proper physical education can be incorporated, and when in addition some steady educational work can be done during adolescence. An ideal way of attaining this is by means of Day Continuation Schools operated under the 'Fisher' Act of 1918. The adolescent has from a half to a whole day a week off work for school attendance for two years, during which time the educational forces are working to fit him or her for life rather than for a 'job'. If the school is merely a vocational technical school it may fail in the main purpose, but if it concentrates on fitting the child for life it can, in conjunction with an industrial medical service, achieve a very great deal. In reply to the critics that this scheme is impractical, the answer is that not only does it work but that as a by-product the industrial concern benefits to such an extent that the system becomes taken for granted by the management as being essential.

The industrial side benefits in two ways. The children are piloted through the unstable stage of adolescence and enabled to fit gradually rather than suddenly into their life's work, and further feel that somebody really cares for their interests and welfare, and they become far more contented and happy workers. This can be opposed on the political grounds that it is likely to delay the raising of the school-leaving age. Though continuation schools are no substitute for this reform they at least bridge a very serious gap in supervision and guidance. It should, however, be opposed if education is to be subordinated to mere training, but where physical and mental education in its fullest sense can be organized in industry, then opposition is itself opposed to the interests of the public well-being. From the public health standpoint no government really interested in the healthy development of the individual can do anything but extend the system of joint medical and educational care of young persons in industry, and if industrial efficiency is raised as a by-product, so much the better. The need will still exist even if the school-leaving age is raised.

The Doctor as a Factor in Management.—In addition to the work of guidance, care, and observation of young people, a medical service in industry concerns itself naturally with the prevention and treatment of accidents at work, with chemical hazards, and with working environment, but also it should deal with every sort of case where by means of regular treatment on the spot a man or woman can go on earning and receive treatment at the same time. This applies to skin conditions, minor fractures, and all ambulatory cases of injury or sepsis. Attendance at a hospital generally means half a day wasted, while no private doctor can possibly apply the dressing personally or give the massage and other physical treatment which can be obtained at his request and with his co-operation from the nursing staff of an industrial clinic.

Taking the matter on to a wider plane, medicine, if it is to do its fullest duty to the worker, to industry, and to the State, has a very definite place in the counsels of management. The doctor who merely *attends* at a factory is only touching the fringe of the problem, for surely he has valuable advice to tender on the many facets of managing a staff. The average industrialist and administrator has his work to do in a non-biological sphere, but every worker and every manager is a biological entity, and someone versed in biological and psychological problems is the fit and proper person to assist in the control of the human side of production and distribution; but to do this effectively demands special study of industrial and economic conditions and needs.

As corporate life, and especially industrial life, comes to be recognized more and more as a biological function, the actions and reactions of man on man, and of man on things, and things on him, must of necessity acquire an added importance. Industry is the basis of the modern scientific state, and on this medicine builds its claim to a share in statecraft. It is not enough to treat patients unless those patients are enabled to find an environment more or less suited to them, or to become suited to the available environment. Many people would not become patients at all if only we applied biological knowledge to industrial and national administration.

Psychology divorced from biology and from medicine is becoming a Tom Tiddler's ground for quacks of all sorts, from so-called efficiency experts to a host of pseudo-scientific 'healers'. In one guise or another it is on the suggestibility of the public that the tune is played. Man is not a rational being, hence it is useless to appeal entirely to reason. The emotions play a vast rôle not only in the political and economic sphere but in the methods of life adopted by the great majority. To leave mass emotions solely in the hands of those who wish to manipulate them for their own pecuniary or political ends is not wise. We, as a profession, must recognize this, and not only adjust our views to fit new facts but also modify our system of medical administration to meet the demands that the new life is bringing to us. This modification involves more co-operation and less individual freedom, but it is the price we must pay for a mechanized way of life. Industry cannot possibly evolve its share of medical services to meet new needs unless it is advised by proper counsel nor can these schemes be worked in the fullest interest of everyone unless staffed by medical practitioners and nurses who are keen to take advantage of the great opportunities which the conditions offer. Medicine and economics; human temperaments and emotions; work and leisure; management and psychology; education, mental and physical, in its widest sense—all come within the scope of industrial medicine, and it is a field that, fully developed, must influence national life considerably in the future.

New Factors in Medical Practice and Education.—It is not too much to say that from such problems as security and insecurity, mechanization and the displacement of labour, boredom and monotony, staff management, industrial absenteeism, emotional and temperamental reactions to working life, and the general system of modern industrialism, medicine on the whole has stood aloof. Too few practitioners know very much about the actual life or organization in modern industry and commerce. This is partly due to a desire not to interfere in fields outside their sphere, partly to the heavy demands of professional life, but also in great part to the fact that many do not realize that these things have great importance and an intimate connection with the clinical problems of the consulting-room. Modern conditions offer great scope for the useful employment of neurotics, and a great deal of the best work is done by them. The system, however, takes a heavy toll and they consequently assume great clinical importance. To neglect the neurotic or to regard him as a mere

nuisance is only comparable to neglecting temperamental racehorses and confining veterinary skill to hack geldings. In this connection the industrial doctor should be able to offer something of real value to the common pool of knowledge that must be drawn on if many disabling incapacities are to be dealt with effectively. It is all a matter of co-operation, and interdependence being an essential element in modern life this co-operation becomes essential. The modern world, owing to rapid and powerful agencies of intercommunication, is highly suggestible and easily led. Many leaders rise to guide it, and one by one they land it on rocks because self-interest, ignorance of essential values, and lack of culture are characteristics of the demagogue.

Medicine is more capable of efficient leadership than we care to acknowledge. Disinterestedness and a definite culture are the most important factors next to skill in regulating the place of medicine in public esteem. By reason of the fact that a culture based on physical and mental well-being is the best foundation for life, medicine has before it a great field of opportunity in statecraft if it will only grasp it. We have to make our voices heard as individuals in education, in industrial management, and in social administration, and to do this we have, besides organizing our work in accordance with modern needs, to inculcate into medical students some of the fundamental ideals and conceptions of social problems in the industrialized state. The average medical student learns little about emotional reactions and knows next to nothing of economic tendencies. Ignorance of these makes his early professional years unduly hard and often not a little futile, and many never acquire the knowledge. Industry under no matter what system it is operated is the life-blood of a modern state. It has its own medical and social problems and it has its own contribution to make towards their solution. Of these none is more important than the development of medical and educational services within industry and the pooling of the knowledge thus gained. The pooling involves the application to medical practice of many new administrative ideas, and it involves as well a system of co-operation affecting every public health service, including hospitals and similar institutions.

REFERENCE.—¹“Industrialized Man and his Background”, *Lancet*, 1934, i, 825.

MEDITERRANEAN FEVER. (See UNDULANT FEVER.)

MELANOMAS, MALIGNANT. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

T. Butterworth and J. V. Klauder¹ have collected a series of 50 cases of malignant melanomas arising in moles. They point out that the prognosis in these cases is extremely bad and that few survive longer than five years. Only 2 of their 50 cases were alive after this time; one of these died ten years after the onset of the disease and the other was alive nine years after. This raises the important question of how moles should be dealt with in order to prevent the onset of malignant degeneration. Only a very small percentage of moles become malignant. The authors consider that the routine removal of all pigmented moles is not practicable, but it appears advisable to remove such lesions when situated on the head and feet, the most frequent sites of malignant melanomas, and to remove pigmented lesions subjected to irritation incident to such objects as razors, corsets, braces, or trusses, or from scratching. They also point out that the colour of a mole is not a criterion of potential malignant melanoma, since unpigmented moles may become malignant, although the occurrence is exceptional. Thorough destruction, including healthy tissue surrounding the lesion and beneath it, by means of the electro-cautery, electro-decathesis, or surgical excision, affords the safest means of removing pigmented nævi. The nævus should be entirely destroyed at one operation. To treat

these lesions by painting with acids, by applying CO₂ snow, by electrolysis, strangulation by tying a string around a pedunculated lesion, or any treatment given at short intervals, is a dangerous procedure which constitutes irritation and affords opportunities for malignant change.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1934, March 10, 739.

MENINGITIS OF AURAL ORIGIN. (*See EAR, AFFECTIONS OF.*)

MENINGITIS, MENINGOCOCCAL. (*See CEREBROSPINAL FEVER.*)

MENTAL DISORDERS AND NEUROSES. (*See NERVOUS DISEASE IN BOXERS; NERVOUS DISORDER IN GENERAL PRACTICE; NEUROSES IN CHILDREN; NEUROSES, OCCUPATIONAL; PSYCHOSES, NASAL SINUSITIS IN; PSYCHOSES, SOMNIFAIINE NARCOSIS IN; SCHIZOPHRENIA; SUICIDE.*)

MIGRAINE.

Macdonald Critchley, M.D., F.R.C.P.

The Migrainous Constitution.—The modern conception of migraine is that of an inborn constitutional trend, usually inherited, manifesting itself in early life, though not in classical and mature form until adolescence. Attacks of migraine are precipitated in such persons by a variety of factors—physical, metabolic, and psychological. In some cases only one particular factor is operative, but more usually the stimulus is non-specific and many factors are capable of precipitating one attack.

But little work has been done in defining the factors which constitute this migrainous diathesis, and for this reason a recent paper on "The Migrainous Patient" by G. A. Touraine and G. Draper¹ is welcome. Although their series of cases is too small (50 in all) to derive impressive conclusions, they have spared no pains in intensive study of the physical and psychological patterns traceable in their patients.

Their first consideration has been one of anthropometry, to determine whether any physical characteristics are detectable whereby the sufferer from migraine may be distinguished from the general American population. The authors believe such features occur. Their main conclusions as to anthropometry are:—

1. Usually the face of a migrainous individual appears to be slightly oversized in relation to the rest of the body. Although this increase may be evenly distributed, there is perhaps greater emphasis in the transverse diameter of the upper facial zone, i.e., between the zygomatica. The eyes are set widely apart, and this impression of unusual breadth is further enhanced by a slight shortening of the nasion-prosthion length. The face index (facial height over breadth) in the migrainous shows a rather longer face than in the general (American) population: males 89.4, females 88 (general population: males 88, females 86).

2. Although there is a heaviness in the region of the symphysis of the mandible, in profile the aspect of a receding chin is almost universally found.

3. Direct observation of the face discloses a distinct exaggeration of the supra-orbital ridges and glabella, which is extended into a well-marked nasalization and prominence of the maxillary region. This may be so marked that, despite the length of the mandible, the effect of over-closure—or beaking—is produced.

4. The teeth are usually large—often markedly so, and may be slightly separated or irregular.

5. The palpebral fissure is of medium width, but there is a slant of the margin of the upper eyelid, suggestive of the mongoloid eye.

6. Notwithstanding the foregoing features, which suggest an acromegaloid trend, the rest of the body shows no such tendency. The hands are often narrow and pointed, reminiscent of those in Fröhlich's syndrome. Hyper-extensibility of the fingers is common.

7. The ensiform was impalpable in 72 per cent of migrainous subjects, compared with 80 per cent of the general population.

8. In migrainous females the most constant morphological features was an over-emphasis of the inner belly of the gastrocnemius muscle—a characteristic usually regarded as one of masculinity.

The authors associate the cranial features in migrainous subjects with the special emphasis of pituitary influence. Their findings must be regarded with interest as the first essays in a research of possibly great importance. It will be recalled, however, that the same authors attempted to define a similar characteristic habitus in victims of poliomyelitis (*see* MEDICAL ANNUAL, 1934, p. 363), but that their conclusions were not supported by subsequent workers.

Pursuing their studies further into the personality and environment of their patients, the authors believe that the headaches first make their appearance at a period when the subject loses the protection of the home circle, and is compelled to stand alone and shoulder the responsibilities of adulthood. The psychological mechanism is visualized by the authors somewhat as follows: there is a conflict between desire to escape from the mother's influence and a compulsion not to leave her. This results in an attempt to remain emotionally dependent upon her. Part of the patient's total personality thus becomes separated and caught up in a maternal attachment. Thus he is retarded in his advance to complete individualism. Each attack of migraine is like a recapitulation of the birth experience and may therefore be precipitated by: (1) The continued oppression of the mother which forces the patient to try to escape; (2) Any implication that a separation is about to take place. These threats may occur either on the conscious or the unconscious level.

It is a well-known fact, of course, that migrainous subjects usually manifest during childhood periodic symptoms we now recognize as being of 'pre-migrainous' nature (*see* MEDICAL ANNUAL, 1934, p. 307). This fact would seem to argue against the authors' views as to the psychological factors operating at the time of the development of overt migraine, but the authors believe that this fact can be reconciled with their hypothesis.

The well-known familial predisposition to migraine is borne out in the cases, mainly appearing via the maternal line. "Unwilling imitation of the migrainous ancestor" is suspected as an important factor in genetic interpretation.

It appears from their analysis that a satisfactory adjustment in the sexual sphere is not found, the psycho-sexual development being arrested as a rule at some point or other.

The authors conclude that the migrainous attack is a syndrome comparable with any other neurosis. The mysterious disturbances of cerebral physiology occurring in the attack are believed to be secondary to the stimulus of the emotional discharge already mentioned. This conception of migraine is believed to explain the difficulties in effecting a cure. Whilst any new treatment may produce a temporary relief—"it is probably safe to say that a true migraine is rarely completely eradicated except by the passage of time, from the life of the sufferer".

Migraine and Hypocalcæmia.—G. F. Norman² has reopened the question of a possible relationship between some cases of migraine and an abnormal low calcium level in the blood. While it has not been the author's experience to find migrainous symptoms in patients suffering from tetany, nevertheless in a number of victims of migraine it was possible to demonstrate certain

hypoparathyroidal characteristics. Thus mild tetanic spasms may occur spontaneously in the hands or else as the result of a short period of hyperpnœa. Chvostek's sign was at times demonstrable. In such cases the calcium content of the blood was low, as well as the Ca level in the cerebrospinal fluid in those cases tested. For this complex the author proposes the term 'migraine-tetanic syndrome'. Of 70 cases with periodic headaches and nausea or vomiting, most have been improved by measures calculated to raise the blood-calcium level. The author employs either viosterol (3 to 10 drops, three times daily) or injections of parathormone (10 to 20 units) every other day. In all cases marked clinical improvement is claimed, together with restoration of the calcium of the blood to its normal level.

Migraine and Epilepsy.—It is traditional to teach that a close association exists between epilepsy and migraine, and at times a more or less identical pathogenesis has been envisaged in the two disorders. To the clinician the connection between migraine and epilepsy may show itself in three ways: (1) Relatives of an epileptic may suffer from migraine, just as epilepsy may occur in the family of a migrainous subject. (2) Migraine and epilepsy may coexist in the same person, though not necessarily related in time. Thus migraine in adolescence may be replaced in later life by epilepsy, or vice versa. Or a person may be afflicted with attacks sometimes migrainous, sometimes epileptic, in character. Regular periodicity may or may not occur. (3) Migraine and epilepsy may occur simultaneously—for example, the patient may suffer the premonitory visual symptoms of a migraine, followed by intense headache. This in time leads up to unconsciousness with convulsion. On recovery, all symptoms of migraine have usually disappeared. These rare and interesting cases belong to the category of 'migraine-epilepsy' proper.

Recently there has been a tendency to suggest that the association between epilepsy and migraine has been a little over-emphasized. In this connection, a recent study by H. A. Paskind³ is of value. The author studied the records of 3326 patients from the private practice of Dr. Hugh T. Patrick. The incidence of migraine in the family, in a parent, and in the patient was set out in a number of different disorders, as in *Table I*.

Table I.—INCIDENCE OF MIGRAINE IN PERSONS WITHOUT NEUROLOGICAL DISORDERS; WITH EPILEPSY; AND WITH OTHER NEUROLOGICAL DISORDERS.

DISORDER	NO. OF CASES	MIGRAINE IN THE FAMILY	MIGRAINE IN A PARENT	MIGRAINE IN THE PATIENT
Non-neurological group ..	331	14.4	10.2	3.3
Epilepsy	783	35.2	30.8	8.4
Manic-depressive psychosis ..	492	34.0	26.4	10.0
Trigeminal neuralgia ..	342	37.7	30.1	23.3
Psychesthesia	890	25.5	21.7	4.6
Dementia præcox	216	32.8	28.7	5.09
Tic	136	37.3	37.3	7.6
Constitutional inferiority ..	73	49.3	43.8	5.4
Paranoid state	63	23.8	22.2	4.7

Comparison of the figures for the neurological group and for epilepsy shows a strikingly greater familial, parental, and personal migraine than in persons without nervous disease. However, the various forms of neurological disease show strikingly high figures also. Thus, there appears to be an even greater association between migraine and trigeminal neuralgia than there is between

migraine and epilepsy. (An association between these two affections has previously been traced by J. J. Putnam,⁴ C. L. Dana,⁵ and F. Levy.⁶ H. T. Patrick⁷ in particular found migraine in 20 per cent of a series of 200 cases of *tic douloureux*). Moreover, there was a greater incidence of parental migraine in *tic* (37.3 per cent) and in constitutional inferiority (42.8 per cent) than in epilepsy (30.8 per cent). As regards the personal incidence of migraine, it is noteworthy that migraine was present in 10 per cent of the cases of manic-depressive psychosis, as compared with the 8.4 per cent of epileptics. The author concludes that the relationship between migraine and epilepsy is not special or specific, since evidences of a similar relationship appear in other nervous affections.

The Use of Ergotamine Tartrate.—The success of ergotamine tartrate (Gynergen*) in the treatment of migraine has been noted in the past by H. W. Maier,⁸ H. Cornil,⁹ M. A. Tzanac,¹⁰ E. Trautmann,¹¹ Targhetta,¹² V. G. Tgnelzi,¹³ and K. Koffmann.¹⁴ A recent paper by W. G. Lennox¹⁵ gives the results of medication with this drug in 45 cases of migraine (6 men and 39 women). It was given for the relief of the attack itself. Abrupt termination of the headache occurred in 40. Of the remaining patients, 3 had no relief at all, while in 2 the attack was probably curtailed. The speed of the pharmacological effect varies according to the route by which the drug is administered. When given intravenously it produces relief in 15 to 30 minutes; when given subcutaneously in 1 to 2 hours, and when given by mouth, in 2 to 3 hours. The recommended single dosage is 0.5 mgrm. subcutaneously or 1.0 mgrm. by mouth. Because patients vary in their mode of reaction to this drug it is advisable to give but half the full subcutaneous dose at the first trial. The injection can be repeated after two to three hours. For a prompt sustained effect Lennox prefers to give 0.25 mgrm. intravenously and at the same time the same amount subcutaneously. It must be emphasized that oral administration is not only a slower but is a much less efficacious remedy.

It is as well to be cautious in the use of ergotamine tartrate in hyperpictic subjects, as a rise in systolic and diastolic blood-pressures usually follows an injection. Pregnancy is a contra-indication to the use of the drug. After the headache ceases patients often notice a sensation of fatigue or soreness in the muscles.

This drug appears to be without avail in the prevention of subsequent attacks, and in any case the dangers of ergotism preclude its regular administration. There is evidence that it may lose some of its therapeutic potency after repeated use.

Contrary to the experience of Trautmann and Kottmann, Lennox found that ergotamine may also relieve headaches which are not of migrainous character.

Testimony as to the beneficial action of ergotamine tartrate is also afforded by an interesting communication from S. Brock, M. O'Sullivan, and D. Young.¹⁶ These authors found that injection of the drug relieved 27 attacks of migraine occurring in 11 women, and 7 attacks in 3 men. It failed three times in the case of two women and twice in the case of two men. In no instance was the headache made worse. Headaches once removed by this drug were always benefited thereby, and, similarly, if the drug failed on the first injection it remained ineffective on subsequent trials. Vomiting frequently accompanied the relief to the headache. The authors confirmed the usual experience that subcutaneous administration is more efficacious than oral. Sometimes regular

*Sandoz Chemical Works, New York. This preparation is sold in Great Britain under the name of *Femergen*.

oral administration, in doses of 1 mgrm. two to four times daily, seemed to reduce the number and severity of attacks. In one case very severe headache occurred when the drug was discontinued, and the authors compare the aggravation of epilepsy after the withdrawal of luminal.

The authors also carried out an interesting series of experiments in their efforts to induce or to relieve an actual migrainous attack by the injection of various drugs as well as by such measures as the inhalation of amyl nitrite and hyperpnœa. Their detailed results are set out in *Table II*, which shows that they could find no consistent provocative measure, though follutein, histamine, and amniotin in large doses were sometimes successful. For the relief of the attack, ergotamine tartrate proved the most successful. The action of mecholin (the acetyl ester of betamethyl cholin), a parasympathetic (vagus) stimulant, was of interest. In 4 women, 6 headaches were relieved very promptly; in 4 other women it failed to relieve at 4 trials. In the authors' most intractable case of migraine, it produced immediate and remarkable relief on three occasions, after many other measures had been unsuccessfully tried. The headache was apt to appear after one-quarter to one-half hour.

Table II.—EFFECT OF VARIOUS DRUGS AND PREPARATIONS ON MIGRAINOUS ATTACKS.

MEASURE USED	RELIEF	DOUBTFUL	NO RELIEF	HEADACHE		
				Intensification	Produced	Not Produced
Hyperpnœa ..	..	..	..	..	..	13 (11F) 3 (2M)
<i>Subcutaneous injection—</i>						
Follutein ..	..	..	..	..	4 (4F)	11 (8F) 2 (2M)
Pitressin ..	..	..	1 (1F)	..	..	4 (4F)
Insulin ..	..	..	..	..	1 (1F)	18 (11F) 1 (1M)
Histamine ..	..	..	5 (4F)	3 (3F)	4 (3F)	5 (3F)
Adrenalin ..	2 (2F)	..	3 (3F)	1 (1F)	..	3 (3F)
Ephedrine ..	2 (2F)	..	6 (4F)	1 (1F)	..	1 (1M)
Ergotamine tartrate ..	27 (11F) 7 (3M)	..	3 (2F) 2 (2M)	..	..	..
Mecholin ..	6 (4F)	..	4 (4F)	..	1 (1F) 1 (1M)	.. 1 (1F)
Amniotin ..	2 (1F)	..	15 (3F)	1 (1F)	3 (2F)	..
Tissue extract 568 ..	3 (3F)	..	3 (3F)	1 (1F)	1 (1F)	1 (1M)
Caffein sodium benzoate ..	..	..	4 (4F) 2 (2M)	..	..	..
Amyl nitrite*	2 (2F)	..	3 (3F)	..	..	..
Calcium gluconate†	..	..	1 (1M)	..	..	1 (1M)
	2 (2F)	3 (3F)	3 (3F)	..	..	..
	..	..	1 (1M)	..	..	..

The numbers refer to the number of experiments. F = Woman. M = Man.

* By inhalation. † By intravenous injection.

Their experience with insulin is also of interest. In 11 women and 1 man 19 injections of 10 to 15 units failed to precipitate an attack in the fasting subject, but produced an attack in the case of one woman. The authors

conclude that a state of low blood-sugar is not an important cause of migraine—an hypothesis once tentatively advanced by M. Critchley and F. R. Ferguson.¹⁷

From their experience the authors conclude that there is more than one pathophysiological factor in the production of a migrainous headache, and they believe that vasospasm is probably a secondary effect of, rather than a primary factor in, migraine.

REFERENCES.—¹*Jour. Nerv. and Ment. Dis.* 1934, lxxx, 1; ²*Jour. Amer. Med. Assoc.* 1934, Feb. 17, 529; ³*Arch. of Neurol. and Psychiat.* 1934, xxxii, 45; ⁴*Jour. Nerv. and Ment. Dis.* 1900, xxvii, 129; ⁵*Jour. Amer. Med. Assoc.* 1900, xxxiv, 1100; ⁶*Essai sur les Neuralgies faciales*, 1906, Paris: Rousset; ⁷*Jour. Amer. Med. Assoc.* 1914, lxii, 1519; ⁸*Rev. neurol.* 1926, i, 1104; ⁹*Soc. de Méd. de Nancy*, 1927, Feb.; ¹⁰*Bull. Soc. méd. Hôp. de Paris*, 1928, lii, 1057, 1929, liii, 495, 1931, lv, 1663; ¹¹*Münch. med. Woch.* 1928, lxxv, 513; ¹²*Sci. méd.* 1929, May 15; ¹³*Med. Jour. and Record*, 1932, cxxxv, 447; ¹⁴*Schweiz. med. Woch.* 1933, lxiii, 572; ¹⁵*New Eng. Jour. Med.* 1934, cxx, 1061; ¹⁶*Amer. Jour. Med. Sci.* 1930, clxxxviii, 253; ¹⁷*Lancet*, 1933, i, 123 and 182.

MONONUCLEOSIS, INFECTIVE. (See GLANDULAR FEVER.)

MUMPS.

J. D. Rolleston, M.D., F.R.C.P.

MORBID ANATOMY.—From personal observations on 10 cases of mumps, F. Rocchi¹ comes to the following conclusions: The fundamental pathological feature of mumps is an interstitial and peritubular exudative and hæmorrhagic lesion. Changes in the parenchyma are inconstant. Stenson's duct does not show a true lymphocytic infiltration but only some mononuclear elements scattered through the connective tissue. An excised lymphatic gland showed merely a simple hyperplasia. The testicular lesions involved the seminiferous tubules and the interlobar connective tissue. There was an accumulation of degenerated leucocytes in the tubules, while the characteristic lesion in the interlobar connective tissue was a hæmorrhagic œdema with only a small quantity of leucocytes infiltrating the parenchyma. A lachrymal gland also presented interstitial and parenchymatous lesions in the form of lymphocytic infiltration.

SYMPTOMS AND COMPLICATIONS.—S. L. Johnson² reports his observations on eight cases of *submaxillary mumps* in patients aged from 11 months to 38 years. The incubation period ranged from eighteen to twenty days. All the patients had been exposed to epidemic parotitis, and none had had a previous attack of mumps. One or both the parotids were affected in half the cases, but the sublingual glands were not involved. No complications developed in any case.

P. Melot³ illustrates the rarity of *mumps in infancy* by the following figures: Of 58,331 cases of mumps reported by Ringberg in Denmark during the period 1870-4, only 205 were in infants. In an outbreak of mumps on an emigrant ship none of the 33 children under 1 year of age was attacked. Meningo-encephalitic forms of mumps appear to be more frequent in infancy than in later life, probably owing to the lack of resistance of the nervous tissue at this age, and nervous sequelæ due to involvement of the cerebral cortex, medulla, or spinal nerves are also more frequent.

J. B. McKinney, H. H. Stewart, and H. I. McClure⁴ report a case of *suppurative ovaritis* during the acute stage of mumps in a woman, aged 43, who contracted the disease at the same time as her two sons. On laparotomy the left ovary was found to be almost entirely necrotic. The right ovary was also the seat of a necrotic process but to a less extent than the left, and on section showed multiple abscesses. Recovery took place and menstruation resumed its normal characters. Only one other case of suppurative ovaritis following mumps is on record (Meinhardt's case), and even this is a doubtful one.

R. Boscher⁵ has collected 25 cases of *primary mumps meningitis* in patients aged from 3 to 45 years, in whom the clinical features were as follows: (1) Slight

and transient parotid swelling; (2) Subsidence of the meningeal signs on appearance of the parotid swelling, which was usually about the fourth day; (3) No other localizations of the mumps virus such as orchitis or pancreatitis. The cerebrospinal fluid in these cases presented the following features: (1) It was clear, non-xanthochromic, and under considerable hypertension; (2) There was considerable leucocytosis; (3) The chloride content exceeded 6.40 gm. per litre, in contrast with tuberculous meningitis, in which it is low; (4) Absence of tubercle bacilli; (5) Negative Wassermann and colloidal benzoïn reactions.

T. L. McEwan⁶ reports a fatal case in a boy, aged 16, of anaerobic meningitis which developed ten days after mumps. There was no autopsy.

T. C. Merrill⁷ records a mild attack of mumps in a woman, aged 65, which was followed by *polyneuritis* affecting the IInd, IIIrd, VIIth, VIIIth, and IXth right cranial nerves. The polyneuritis lasted for two months and ended in complete recovery.

REFERENCES.—¹*Pathologica*, 1933, xxiv, 690; ²*Arch. of Pediatrics*, 1934, lii, 240; ³*Thèse de Paris*, 1933, No. 533; ⁴*Lancet*, 1934, ii, 22; ⁵*Thèse de Paris*, 1933, No. 246; ⁶*Lancet*, 1934, i, 1058; ⁷*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1934, lviii, 526.

MUSCLE, SARCOMA OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The two most common tumours of muscle are hæmangiomata and sarcomata. E. M. Bick¹ finds that of 35 tumours involving the skeletal muscles, 57 per cent were sarcomata. The greater number of these were classified as fibro-sarcomata. These tumours may occur at any age. It is not true to say that they are more common in youth. Bick found them most frequently in the fourth and fifth decades. The ages of 20 cases ranged from 10 to 60. The thigh, the abdominal wall, and the forearm are common sites; pain is rarely an early symptom. Primary muscle tumours in general have a characteristic mobility before adjacent tissues are involved.

TREATMENT.—This consists in wide excision of the tumour with the surrounding muscle as extensively as possible. Following this there should be given a prolonged course of deep radiation. The latter is advocated with full appreciation of the fact that tumours of connective-tissue origin stand well down in the series of radiosensitivity. Radiation, while always to be advocated, is still of doubtful efficacy in determining the outcome of any given case.

REFERENCE.—¹*Ann. of Surg.* 1934, June, 949.

MUSCULAR DYSTROPHY.

Macdonald Critchley, M.D., F.R.C.P.

Treatment with Glycine.—Considerable attention has been devoted during the past few years to the biochemical changes occurring in the myopathies, and also to the effect of glycine ingestion upon these changes as well as upon the clinical state. An imposing literature has grown around the subject, but the most recent valuable study of D. P. Cuthbertson and T. K. MacLachlan¹ may be quoted *in extenso*, as carefully summarizing previous research, as well as presenting the results of their own work.

In the *MEDICAL ANNUAL* for 1933 (p. 297) the stages in the comprehension of the creatine metabolism were outlined; in this present review some of the more important steps may be mentioned again.

The most important of the abnormalities are as follows:—

1. Diminished excretion of creatinine in cases of myopathy.
2. The presence of creatine in the urine in cases of myopathy.
3. Whereas creatine administered orally in small quantities to normal adults is retained, a very large proportion is excreted in cases of myopathy.
4. Oral administration of gelatine or glycoeyanine increases the urinary output of creatine in cases of myopathy.

5. Oral administration of glycine also increases the output of creatine in cases of myopathy. If, however, the ingestion of glycine is continued, the creatinuria is found to decrease after a few weeks, until it finally reaches its former control level.

6. At the same time as the creatinuria decreases there occurs a rise in the output of creatinine.

Coincident with the alterations in the creatine metabolism resulting from glycine ingestion, clinical improvement has also been recorded in cases of muscular dystrophy. A. T. Milhorat, F. Techner, and K. Thomas² noted remarkable improvement in the patients' condition. More recently, Milhorat³ has added to the descriptions of the original cases, and has brought forward some additional material—making a total of 14 cases of muscular dystrophy. Very marked improvement was claimed in 2 cases, and slight improvement in 1 other. The other 9 remained unchanged or else regressed. Improvement has been claimed by H. H. Beard and C. J. Tripoli,⁴ by A. Chanutin, H. R. Butt, and L. T. Royster,⁵ and by S. Kostakon and A. Slauek.⁶ A. F. Voshell⁷ could express no definite opinion on the value of glycine in this disorder. In some of Milhorat's cases a biopsy was performed before and after glycine medication; whereas prior to the treatment there were atrophied, partially atrophied, and normal muscle fibres visible, after glycine there were no partially atrophied fibres—the presumed explanation being that those incompletely atrophied had recovered.

Cuthbertson and MacLachlan's series comprised 9 cases of muscular dystrophy, 5 being of the pseudo-hypertrophic type. The authors confirmed in general the previously described biochemical changes: the greater the degree of incapacity, the greater the creatinuria. A temporary increase in the creatinuria followed glycine administration, the atrophic cases showing the least response. Following a period of maximum creatinuria, the daily excretion gradually fell.

From the clinical standpoint it may be said that all cases showed some general improvement. A feeling of well-being was experienced by all except one, who was subject to attacks of depression. Generally power was regained. Locomotion and other movements not specially affected by the disease were carried out more easily without the previous sensations of fatigue. In the authors' opinion this general improvement was greater than might be expected from mere rest in bed and hospital régime. They also considered that there was some improvement in the power of some of the myopathic muscles; this was least apparent in the pseudo-hypertrophic group. The authors emphasize that in no sense of the word can the term 'cure' be applied to their results; in no patient previously unable to rise from the floor, or to sit up in bed, or to climb stairs, did these faculties return. General and local regression appeared to occur after cessation of glycine treatment.

REFERENCES.—¹*Quart. Jour. Med.* 1934, iii, 411; ²*Proc. Soc. Exper. Biol. and Med.* 1932, xxix, 609; ³*Deut. Arch. f. klin. Med.* 1933, clxxiv, 487; ⁴*Jour. Biol. Chem.* 1933, c, Proc. 14; ⁵*Ibid.* 26; ⁶*Deut. Arch. f. klin. Med.* 1933, clxxv, 25 and 302; ⁷Cited in *Jour. Amer. Med. Assoc.* 1933, c, 1895.

MYASTHENIA GRAVIS.

Macdonald Critchley, M.D., F.R.C.P.

Treatment with Ephedrine and Glycine.—In 1930 Harriet Edgeworth¹—a sufferer herself from this disease—found that ephedrine by mouth was followed in her own case by rapid clinical improvement. She has given us an interesting record of her own symptoms and therapeutic experiences. Following her publication other neurologists have employed this drug in the treatment of myasthenia gravis. Thus D. McAlpine² has reported success with the use of ephedrine in $\frac{1}{2}$ -gr. doses twice daily in three cases of myasthenia

gravis. There is a tendency, however, not to rely completely upon ephedrine, but to use this drug in conjunction with glycine, as tried by Boothby. Glycine alone has indeed been used by L. Remen,³ W. Gros,⁴ and also at one time by Boothby, but seems to have given place to the combined treatment with ephedrine. There is in fact a certain amount of experimental justification for making use of this combination, for E. Abderhalden and E. Gellhorn⁵ have shown that the action of normalin upon frog-muscle preparations is enhanced by the addition of an amino-acid. Out of a total of 12 cases of myasthenia gravis treated with ephedrine and glycine, W. M. Boothby⁶ found a definite improvement in 10, in 4 of which the amelioration was very marked indeed. Glycine was also given to one of McAlpine's cases, and although it failed to relieve the intense bulbar symptoms, myographic records seemed to give a better result when the patient was taking glycine in addition to the ephedrine. Speaking of one personal experience of a glycine-ephedrine combination, Edgeworth⁸ reported: "How ephedrine produces a continuous improvement in some patients with myasthenia gravis is unknown. The daily ingestion of it over a period of three years has changed me from a totally helpless bedridden person to my present condition, where I live a comparatively comfortable and pleasant life of some usefulness. I have taken glycine daily for several months, discontinued it, and then resumed it, without demonstrable beneficial effects; but the apparently beneficial effects on other patients using glycine has thoroughly aroused my interest." E. O. G. Schmitt⁷ also confirms the value of combined ephedrine and glycine. He points out that glycine produces in patients with myasthenia gravis an increase in the output of creatinine and a drop in the excretion of creatine.

As regards dosage, one may say that glycine may be prescribed twice a day in doses of 15 gm. Twenty minutes afterwards ephedrine can be given in doses of $\frac{3}{8}$ to $\frac{1}{2}$ gr. Larger doses do not afford a correspondingly greater measure of improvement, and the total daily amount should never exceed $1\frac{1}{2}$ gr.

It may perhaps be advisable to point out that glycine (or glyecoll) is amino-acetic acid, $\text{CH}_2\text{NH}_2\text{COOH}$; this is acetic acid (CH_3COOH) with one hydrogen ion replaced by NH_2 , and must be carefully distinguished from the photographic developer sold under the name of 'glycin'. This latter is a very different compound—parahydroxyphenyl-amino-acetic acid, $\text{C}_6\text{H}_4\text{OH.NH.CH}_2\text{COOH}$ —and is poisonous. To avoid confusion, it might be wiser to use regularly the term 'glyecoll' instead of 'glycine'.

McAlpine has pointed out that glycine may be prescribed in an inexpensive form as gelatin. Thus, 80 gm. of gelatin boiled down into a jelly may be ordered daily. The glycine content is approximately 25 per cent.

Treatment with Physostigmine.—On the assumption that the abnormal fatigability in myasthenia gravis might be due to the curare-like action of some substance at the myoneural junctions, M. B. Walker¹⁰ tried the effect in this disease of physostigmine, a partial antagonist to curare. The beneficial effect of hypodermic injections of physostigmine salicylate was striking in the case of a female victim of myasthenia, aged 56. At first injections of $\frac{1}{60}$ gr. were tried once daily. Within half an hour there would occur a disappearance of the ptosis, the arm movements would become stronger, the jaw would droop less, the swallowing improve, and the patient feel 'less heavy'. The effect wore off in two to four hours. With doses of $\frac{1}{30}$ gr. the improvement was greater and would persist for four to five hours. Still greater relief, lasting six to seven hours, followed injections of $\frac{1}{15}$ gr., but the patient would complain of feeling faint and trembly, or that "her inside seemed all of a work." These disagreeable sensations lasted about an hour. Vomiting sometimes follows

the larger doses, but this can be controlled by means of atropine, without losing the beneficial action on the muscular weakness. Physostigmine salicylate, $\frac{1}{60}$ gr., produced no effect in Walker's patient when given by mouth, but an hour after $\frac{1}{30}$ gr. slight improvement was noted.

Although the benefit of physostigmine was transitory, it was quite considerable in degree. Walker suggests that it might have an important effect in tiding a patient over a respiratory crisis, and might also prove useful in controlling the difficulty in swallowing.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1930, cxiv, 1136; ²*Lancet*, 1934, Jan. 27, 180; ³*Deut. med. Woch.* 1932, lviii, 889; ⁴*Munch. med. Woch.* 1934, April 6, 526; ⁵*Arch. f. Physiol.* 1924, cciii, 42, cxi, 154; ⁶*Arch. of Internal Med.* 1934, Jan., 39; ⁷*Jour. Amer. Med. Assoc.* 1934, Jan. 27, 259; ⁸*Ibid.* 267; ⁹*Ann. of Internal Med.* 1934, vii, 948; ¹⁰*Lancet*, 1934, June 2, 1200.

MYXEDEMA, HEART IN. (See HEART IN MYXEDEMA.)

NASAL SINUSITIS IN THE PSYCHOSES. (See PSYCHOSES, NASAL SINUSITIS IN.)

NEPHRITIS AND NEPHROSIS. (See RENAL DISEASES.)

NERVOUS DISEASE IN BOXERS. Macdonald Critchley, M.D., F.R.C.P.

The study of head injuries has recently been enriched by various investigations upon professional pugilists, who in the course of their work sustain a large number of major or minor cerebral traumata. Two chief types of professional injury occur—namely, those due to isolated severe blows causing marked clinical effects almost immediately, and those resulting from the accumulation, over the course of long periods of time, of a series of minor traumata. In 1928 H. S. Martland¹ described under the term 'punch-drunk' a clinical state supervening in pugilists who had been at the game for a number of years. The author pointed out that the less successful boxers, who have been notorious not so much for their speed or agility as for their capacity to bear punishment, are more liable to this affection. He drew a parallel, in fact, between the degree of facial disfigurement and the intensity of the punch-drunkenness. Early symptoms consist in occasional clumsiness of one foot, ataxia, and periods of mental confusion. The patient may remain in this state without having to give up boxing; others deteriorate, however, and show dragging of the legs, tremors, dysarthria, deafness, and slowness of movement and of cerebration. In severest cases gross nervous and mental disability may develop.

E. Jokl and E. Guttmanu² also found permanent neurological changes in a series of middle-aged boxers, comprising dullness, or dementia, and such focal nervous signs as alteration in the reflexes, inco-ordination, and dysarthria. These authors also studied the more acute cerebral symptoms in pugilists, and pointed out that after a knock-out a boxer may suffer from amnesia and impairment of consciousness, although still able to carry out ordinary actions without exciting comment. A true knock-out, according to these authors, is not as harmless as is usually believed in sporting circles. They have recorded numerous neurological manifestations during the twenty-four hours immediately following a knock-out blow: ocular palsies, severe headaches, dysarthria, and defects of memory. Such symptoms may endure for some time. One case of duodenal dyskinesia with jaundice is reported. It is said that the unconsciousness after a knock-out differs from that of concussion in the evanescence of the symptoms and the usual lack of sequelæ. Traumatic rupture of meningeal vessels is rare in boxing.

Three interesting cases of "traumatic encephalopathy" in boxers have lately been described by H. L. Parker³ :—

Case 1.—A man of 24 who had been boxing since he was 15. He was not a clever boxer but a very 'game' one, and had been hit unconscious many times. After a year's rest from the ring he staged a come-back; in this encounter he was felled twice in the third round. He took a count of nine and finished the fight of six rounds. A few minutes after the fight he began to vomit repeatedly, and on his way home reeled about as though drunk. Next day he was very unsteady, and kept to bed for three days, complaining of nausea and double vision. After a fortnight he returned to work, still slightly ataxic. Two months later he began to train for another fight, but found that his legs became tired very quickly and tended to drag. On examination the patient showed some dragging and unsteadiness of the limbs; he was nervous, tremulous, and forgetful. Blood-pressure measured 130/76. All tendon reflexes were greatly exaggerated. Nystagmus was present when he looked to the side.

Case 2.—A man of 30, a pugilist since 16 years. He had never risen high in the ranks and displayed the usual stigmata of his trade. In 1921 he was knocked unconscious in a fight; angry at his defeat, he got drunk that night. Commencing his training next day, he found that his right leg tended to catch in a skipping rope. He fought three fights afterwards, and after the last he found his right leg weaker; both lower limbs dragged and felt numb. Stiffness and slowness of the legs gradually increased, more especially on the right side. The speech became nasal and indistinct. Two years later the right arm became stiff, clumsy, and awkward. His mental powers gradually became reduced. On examination, four years later, a spasto-ataxic gait was noteworthy. The muscles of the right arm and trunk showed continuous irregular spasms, sufficient to pull him backwards and to the right. All movements were slow and clumsy. The tendon reflexes were exaggerated on the left side and there was a Babinski response at the left sole. Oppenheim's sucking-reflex was demonstrable. The speech was slow, indistinct, and nasal. His laugh was rather spasmodic in character. The mentality was obviously childish.

Case 3.—A man of 28 had become a professional pugilist at the age of 18. After some years he developed a clumsiness of the left hand and foot; later it was noticed that the sole of the left foot used to slap the ground as he walked. A year later he became at times thick in his speech and ataxic; on more than one occasion he was accused of being drunk. Symptoms gradually increased in degree, and he was ignominiously defeated by a boxer he had previously overcome with ease. On examination it was found that his speech was very dysarthric. The gait was spastic, especially on the left side. The upper limb was slow and clumsy. Tendon reflexes were everywhere much exaggerated, and a left-sided Babinski response could be obtained. Sucking-reflexes could be demonstrated. General intelligence and mentality were much reduced.

Although these three cases differ somewhat one from the other, they agree in manifesting the results of diffuse cerebral lesions. Intercurrent infection with syphilis or with epidemic encephalitis is of course possible, but has been considered improbable by the author. No pathological data have been put forward so far in such cases.

A certain degree of resemblance between some features of Parker's cases and those of traumatic Parkinsonism is of course evident. (*See MEDICAL ANNUAL, 1932, p. 348*).

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1928, xci, 1103; ²*Munch. med. Woch.* 1933, i, 560; ³*Jour. Neurol. and Psychopathol.* 1934, xv, 20.

NERVOUS DISORDER IN GENERAL PRACTICE.

H. Devine, M.D., F.R.C.P.

F. Bodman¹ states that the common nervous disorders make up a large fraction of the practitioner's daily work. At a conservative estimate 25 per cent of the patients encountered in general practice are, in Bodman's experience, suffering from functional disorders. The first problem is to recognize the functional nervous disorder when it presents itself for diagnosis in the consulting-room. This can sometimes be easy and sometimes difficult. When the diagnosis is easy the treatment is often difficult; on the other hand, when

the diagnosis has taken an hour there is often no treatment, as the patient is well. Another paradox: when the patient attributes his illness to some disorder of one of his organs it is often found that he is suffering from a neurosis, and when the patient complains of 'nerves' a masked hypothyroidism, a latent hypoglycæmia, or a toxæmia from hidden septic focus may be suspected. Many somatic discomforts are frequently associated with unconscious emotional conflicts. D. A. H., or disordered action of the heart, was a masterly compromise: nothing organic, but the patient was palpitating with fear. Other examples are psychogenic asthma, miners' nystagmus, and psychogenetic Ménière's syndrome.

In dealing with the psychoneurotic it will be found that a 'spot' diagnosis will be denied by the patient. Cure will depend on his working out his own solution, he must *feel* that it is correct. In a number of cases the motives of the neurosis are not difficult to discover. The girl confronted with developing contours and the onset of menstruation dimly comprehends the underlying problem of sex, and, if unprepared, is apt to evade the issue by embarking on a strict diet in the vain hope of arresting the progress of nature, and thus drifts into anorexia nervosa. Anorexia is not uncommon also in women of maturer years, and in almost every case inquiry will establish that the sufferer is faced with an apparently inexorable fate from which she has but little hope of escape and no avenue for expressing her despair. In the male adolescent there are disturbing changes in his physiology which lead to masturbation, and in a number of cases anxiety states occur. They go in for strenuous athletics, make all kinds of fanciful alterations in their diet to avoid stimulation, and follow an ascetic regime of cold baths and long walks, all to no purpose. The occasions for remorse still recur. Most of them live in constant dread of remote but certain consequences of spinal degeneration, of insanity, or loss of virility. Most of the patients are clerks, not earning enough to be independent of the paternal roof or to afford the pleasure of female society, and subject to the restrictions of a strictly regulated, often nonconformist, household. The writer quotes Culpin, who says that the treatment of masturbation resolves itself into treatment of the emotions of adults in regard to it. Masturbation is a symptom, not a disease, a symptom of cowardice about life in general and sexual life in particular.

Approaching marriage is also the occasion of much neurosis. Amongst the functional disorders observed by Bodman have been a functional leucorrhœa, a lingual neuralgia, a cardiospasm, a 'colitis', and anorexia with cough. Married life is a frequent cause of neurosis. If one partner cannot live up to an adequate standard of social and sexual co-operation, he or she must safeguard himself or herself by a series of evasions, arrangements, compromises, hesitations, fraudulent devices, and confidence tricks which they put across themselves. The flight into illness usually develops after some genuine occasion, such as an operation for a real appendicitis, the birth of a child, or a pneumonia. Convalescence is prolonged, and the woman states that she has never been the same since her operation or her baby. A state of chronic invalidism develops which resists all tonics, recurs after every change of air, and is the despair of the family doctor. The blame which the patient refers to her appendicitis or the 'shock' of labour is really a displacement of affect. The woman is really blaming the circumstances of married life. The conflict in such cases is deep and unformulated. It is based on the conflict between the will to power which appears in every human relationship and the submission and dependence which are the biological requirements of sexual life in women. Many psychoneurotic manifestations are also exhibited at the menopause and in old age. Thus every age has its potentialities as a 'dangerous' age.

R. D. Gillespie² also writes on *psychotherapy in general practice*. The writer states that at the department for nervous diseases at Guy's it was found that of approximately 600 consecutive cases, 436, or nearly three-quarters, were diagnosed as psychoneuroses, and 120, or under one-quarter, were diagnosed as psychoses. He expresses the view that it would be a mistake to regard the above figures as more than a pointer towards the relative numerical importance of psychoneuroses and psychoses. It is extremely probable that the incidence of psychoneurotic conditions among the general population is considerably greater than the figures for a special clinic indicate.

The Psychotherapist's Equipment.—A considerable number of psychoneuroses do not require a highly specialized technique. The first requirement of a psychotherapist is a good knowledge of general medicine. In mental illness of any kind it is still clinical observation that matters most. For the great majority of the psychoneuroses serological, radiological, and other laboratory experiments are only of negative value, as excluding the possibility of organic disease. Much of the rest of the psychotherapist's equipment is already contained in the phrase 'a knowledge of general medicine', because that knowledge should include something about the psychology of human nature. Such knowledge requires a sympathetic acquaintance with the envyings, jealousies, rivalries, as well as the affections. The general practitioner should have an appreciation of the power of conflicts arising in such tendencies to produce bodily disturbances—in other words, he should have an appreciation based on experience of how psychological factors can cause what looks like 'disease'. Psychological examination is first directed to eliciting the presence of symptoms which are psychological. The cross-section clinical examination of the psychological factors is, however, only diagnostic in aim; for treatment the longitudinal method—in other words, the taking of the history of the patient as well as the history of his symptoms—is essential. In his paper Gillespie gives a classification which will be found helpful to the practitioner, and cites a number of cases which he personally treated, together with a brief account of his methods of dealing with them.

W. Langdon Brown³ observes that a striking feature of twentieth century medicine is a return to the cult of Æsculapius: cleanliness, fresh air, suggestion, dream analysis, and psychological explanation. These were the cardinal tenets of the cult, and it is a striking fact that all of them were lost by medicine until quite recent times. This modern return to Æsculapius is a recognition of the importance not only of the disease which the patient has, but of the patient who has the disease—his reactions as an individual, his environment, and his hereditary trends. The old adage "examine the whole of your patient" thus assumes a new meaning. It is by the combined attack on the physical and psychological side that medicine in the future will make advances and still further aid human suffering.

Every patient who consults a doctor is in a state of fear. He is thereby rendered more suggestible, and the attitude of the doctor, whether encouraging or the reverse, can profoundly affect his autonomic nervous system through his emotions, and thereby practically every chemical reaction throughout his body may be modified. Herein is the scientific explanation of the fact that the best of tonics is hope. But an essential factor in hope is faith. The patient must believe in the doctor, in his knowledge, care, and skill. The doctor will have to give good grounds for his faith, and in order to inspire it no aspect of the case must be neglected. Organic disease is not so common as is often supposed. Langdon Brown states that he has asked various practitioners what proportion of the patients they see are suffering from functional rather than organic disease; not one of them placed it at less than 40 per cent, while

some put it as high as 75 per cent. That is to say, about half to three-quarters of these patients were, broadly speaking, finding difficulty in adapting themselves to their environment. Their trouble might be due to environment, but it might be due to themselves. A disturbing emotion will cause palpitations and a sinking sensation in the stomach. The normal person recognizes this for what it is worth; the psychoneurotic concludes he has heart disease or a gastric ulcer. This enables him to fulfil his subconscious or unconscious desire to retreat from life and evade his duty as a member of the social organism.

The foundations of the psychoneuroses are already fairly clearly known; the plans on which they are formed are consistent and comparatively few, but the elaborations and resistances which built up these plans and foundations are often baffling. Yet with sympathy and encouragement they may often be elucidated and the sufferer greatly helped. Although it is true that complicated cases of this sort call for specialist treatment, it is equally true that the ordinary doctor who goes about with his eyes open for the psychological aspect of disease will soon find that he can greatly increase his usefulness.

The Application of Psycho-analytic Concepts to General Psychotherapy.—M. W. Peck⁴ discusses this subject. Psycho-analysis has been called the 'major surgery' of psychotherapy, and in many ways the analogy holds good. Like surgery, it is often a method of choice for conditions not modifiable by more simple methods. Like surgery, again, it is neither necessary nor desirable for general application. Like surgery, it is limited in its scope and cannot do the impossible. The major surgery of the mind must obviously be done by those specially trained in its technique, but psychotherapy in general plays too large a part in medical treatment ever to be monopolized by specialists, psycho-analytic or otherwise. The majority of such work will always be done by practitioners in every field, with the family physician in the lead. The logic of medical progress demands that with the new knowledge of mind made possible by psycho-analysis this therapy may be employed by the physician with new understanding and skill. His intuitive art, which has been a chief resource in the past, can now be reorganized and extended by the acquirement of a more standardized technique. In coming generations the physician untrained in the psychotherapy which he practices should be as rare as one who is unfamiliar with asepsis, or who prefers the palm of his hand to a clinical thermometer. This paper includes a lengthy discussion of the influence of psycho-analysis on other methods of psychotherapy. It is the essential aim of the writer to bring psycho-analysis from its isolated position as a highly technical specialty into more close connection with that everyday psychotherapy which for the majority of neurotic problems must continue to be the main resource in medicine. Peck considers it is also desirable that the conscientious physician should not feel that because he is untrained in mental major surgery he should leave the whole field of psychotherapy to other hands. In this department of medicine there is need for minor surgery as well as major, and the former can be competently done by all physicians, general or special, who, in earnest spirit, are willing to undertake it.

Psycho-analysis and Modern Medicine.—E. Jones,⁵ in an address on this subject, observes that psycho-analysis, which is the essence of modern clinical psychology, lays stress on the active functioning of the personality for its criterion of the severity of mental disorder. More than this, it conceives of such disorder in terms, not of lesions, but of dynamic, striving impulses in the mind. Its psychopathology is cast throughout in dynamic terms, even to

the problem of etiology. Just as modern medicine goes beyond the static picture of lesions and seeks to understand the disturbance in organic function, so does psycho-analysis pass by the older categories of cognition, perception, etc., and seek to understand the dynamic processes of the mind—the motivation, purposes, and tendencies that produce a particular mental attitude or reaction.

There is a vast field of neurotic disorder. How large this is cannot easily be computed, but the writer states that he has many times known experienced practitioners estimate the actual complaints and suffering for which they are consulted, irrespective of whether organic disease is present or not, as varying between 60 and 90 per cent—at all events the vast majority. Even if we say that the body is one-half of the organic personality and the mind the other half, then it follows that general medicine—by studying physiology and pathology—offers the possibility of understanding one half, clinical psychology the other half. After discussing the problem of mental pain, instincts and conflicts, and psycho-analysis and bodily disease, Jones points out that psycho-analysis vastly extends the scope of practice. So much is this so that a considerable proportion of patients who apply for analysis would never have regarded their problem as coming within the medical purview. It is becoming plainer that many difficulties in life that would previously have been called social or moral problems, or thought to be due to unalterable individual peculiarities, are really in a great part the product of mental complexities that fairly come into the field of psychopathology. Moreover, they can be beneficially treated by regarding them from this point of view. The reason for this is that if a neurosis or psychosis is left to run its own course it tends to evolve through a stage of clinical symptoms and personal suffering—where also it would be recognized as in some sense ‘medical’—then through a further stage of anti-social attitudes (hatred and aversion), and to culminate in some form of pure inhibition. Inhibition is the ultimate goal; but the neurosis traverses various more or less stormy stages before reaching it. Symptoms signify our happiness: inhibition signifies the renunciation of happiness—and all the efficiency that goes with it.

The social difficulties referred to by the writer concern these later stages of the neurosis. Perhaps the commonest example of them is marital unhappiness. In certain phases this may reveal itself in gross ‘medical’ manifestations—namely, impotence or anaesthesia—though even here one may find that there are so many forms of these that they are overlooked clinically, and further that medical practitioners commonly underestimate both the frequency and the significance of such troubles. More often, however, sexual difficulties fall into the background of the picture, and the dissatisfaction works itself out as envy and bickerings over petty factors, most often in regard to money. Regressions to infantile patterns are exceedingly common in married life; indeed, in some degree they occur in the vast majority. The mate becomes unconsciously identified with the corresponding parent, and the imperfectly solved ambivalence towards that parent—with its buried hostility, anxiety, and dependence—is transferred to the mate. Thus it has to be realized that a large amount of so-called marital incompatibility, with its destructive effect on happiness and social efficiency, is really of psychopathological origin and that this knowledge must clearly open an extensive new field of work to the medical profession. There are many other new fields of which the same may be said. Difficulties, inefficiencies, or even pronounced inhibition are very common in daily work, with the most serious personal and social effects. Difficulties in ‘getting on’ with one’s fellows, perhaps especially with superiors or perhaps in general social life, are also exceedingly common. Sexual

perversions are also to be found both in a manifest form and, much more often, in disguised forms that produce other manifestations such as drug addiction, alcoholism, and eccentricity.

REFERENCES.—¹*Bristol Med.-Chir. Jour.* 1934, li, 46; ²*Lancet*, 1933, i, 1; ³*Ibid.* ii, 820; ⁴*New Eng. Jour. Med.* 1934, cex, Jan., 207; ⁵*Lancet*, 1934, i, 59.

NEUROSES IN CHILDREN.

H. Devine, M.D., F.R.C.P.

Psychological Effects of Bodily Illness in Children.—D. Forsyth¹ states it is only to be expected that children, in keeping with their sensitiveness to early experiences, will be affected psychologically by bodily illnesses. It should be generally recognized that the dispositions of invalid children may be subtly and profoundly changed in ways which may persist after convalescence and even throughout life. But since these changes are usually gradual and a child is hardly able to speak of them, they are not often understood by the parents and are rarely attributed by them to their real origin. It is beyond the children to formulate the explanations of illness which science provides—e.g., that diseases are produced by germs—and their ideas pass through two stages. When very young, they believe that illness with its pain and discomfort is due to some living being in themselves. Later, and for a good many years, they regard illness as a punishment. This they suppose can only be suffered in connection with something wrong they have done, and their feelings of guilt come into close relation with their notions about illness.

In a *brief illness* a not unusual effect is a retardation of a child's mental development, and in a younger child regression of character and intelligence. This is due partly to restricted activities, but also to certain features of a sick-room. By confinement to bed the child experiences anew the life with which it was familiar in the cot during its first years. With briefer illnesses the retarded development may only be noticeable for a few weeks afterwards, but in others the psychological effects may be more lasting, and may continue into even adult life—for instance, when the illness has been accompanied by suffocative symptoms. Another effect is to intensify the fear of death, especially in cases of heart disease. This may be due to remarks by the doctors, who do not always remember how alert a child's ears can be, and how readily a casual word may be picked up and become a source of secret fear for years after.

Neurotic children are often relieved of their symptoms when confined to bed. These are the cases in which the nervous trouble is bound up with jealousy of a brother or sister in the mother's affection. Illness secures something of the mother's care and attention. Psychological changes may also follow a surgical operation. All too often children are operated upon without a word of explanation, even from those they trust. It feels betrayed by those it loves best, and henceforth a barrier of mistrust is likely to stand between it and its parents. Another common effect of an operation is to leave a child frightened not only about doctors but in everyday life also. Many a child has had its normal, happy self-confidence permanently changed to fear and timidity after taking part in a 'field-day' at a hospital throat department, where tonsils are removed wholesale in a scene of blood, with children crying and vomiting all round.

When convalescence begins after an acute illness children are often irritable, but once the child is up and about the irritability soon goes. Most children are glad to resume an active life, but some really enjoy being ill—once the worst is over—and may be little disposed to hasten their convalescence. The advantage in prolonging their recovery is to continue, if at home, to preoccupy

their mother's attention to the exclusion of the rest of the family, and if in hospital, to be spoiled by the nurses.

It is in *chronic infirmities* of any kind that the most insidious and deep-going effects may be traced, so considerable is the interference with a child's daily life. Common examples of these chronic conditions are infantile paralysis, heart disease, congenital deformities like club-foot, and the crippling tuberculous disease of joints or spine which entails confinement to bed perhaps for months or years. In addition, facial disfigurements such as naevus, hare-lip, and squint, by being noticeable by everybody, often react on a child's mentality. Of all the harmful effects, perhaps the most frequent is an inferiority complex. This may result in a sense of guilt, and the child looks upon his illness as a punishment for wrong-doing and sin. This belief leads to mental depression and remorse. Later he begins to feel he has been punished unjustly, and regards himself as the innocent victim of the world around him. Then he comes to blame his parents for his infirmity, and as he settles into more or less sustained antagonism, the whole atmosphere at home is changed. And yet, as he is unable to put his grievance into words, his parents are little likely to do much to remedy the unhappy situation. Much more probably their own unfriendliness will be stirred against their tiresome child. In the end the child is driven to the conclusion that on account of his wrong-doing he has become unlovable to his parents; and nothing so undermines a child's self-confidence as the belief that he is unworthy of love.

In such cases an inferiority complex may come to be replaced by a superiority complex. A similar reaction to a physical handicap may be seen in adults who are undersized (dwarfs especially), misshapen, or very ugly. With these the feelings of superiority often take the form of obvious conceit. Another common harmful effect is a supersensitiveness to a physical defect, especially one like a club-foot or a birth mark. Invalidism may be responsible for undue selfishness, perhaps associated with self-assertiveness, in a child who has been pampered on account of ill health. Yet another reaction is jealousy directed against children who are fortunate enough to be sound in health. This too may lead to a sense of grievance which tends to set the child against the whole world, and this embitterment on the one side is only too likely to provoke hostile feelings in the other members of the family. Not a little of the gratuitous offensiveness, and even worse, that is met with in adult life originates in the childhood experience of not being loved. Finally, the writer points out that not all the effects of invalidism are necessarily harmful, and a few of them can be entered on the credit side. Thus physical inactivity tends to make a child indulge unduly in phantasying—a habit which, though it favours the development of a dreamy nature, also provides exceptional opportunities for ambitious phantasies; and these may remain a powerful driving force behind its adult enterprises. The association of physical inactivity with phantasying favours also the growth of the contemplative faculties, with an outcome that may sometimes be seen in the later choice of a vocation such as authorship or art.

Anxiety and Children's Behaviour.—W. Moodie² points out that while many disturbances of behaviour in children are complicated and require treatment by someone who has had special experience of them, there is one common type of disturbance which responds to comparatively simple treatment—that associated with increased psychic tension, which in its escape gives rise to unnatural behaviour of one kind or another. Clinically, children affected in this way may be excitable, nervous, over-active, unstable, and tense. On the other hand, some display symptoms of a negative kind, being shy, timid, fearful, and retiring; but this is only another type of response to the tension

within, and is, in fact, likely to cause more trouble than the more overt behaviour already mentioned. In a third group the personality may not be altered to any very apparent extent, but some symptoms, such as enuresis, nail-biting, thumb-sucking, or abnormal fears, may attract notice. Careful observation will, however, reveal in these cases some degree of personality change indicative that the symptom is something more than a bad habit.

In the active type the tension finds escape in excited behaviour, and the extent to which this may occur is limited only by the tolerance of the parents. If the release is complete, the child will probably develop normally, though while doing so he will be most trying to live with, and his manners will be far from pleasant. It is likely, too, that his education will suffer, and, in spite of modern theorists, there is still a general belief that education, even the learning of facts, is of some value.

The basic tenseness is sometimes called 'anxiety', and it does bear many resemblances to the anxiety state of adults; but it is in reality something much more primitive, and in many cases the children show no external evidence of mental anxiety. Under these circumstances any suggestion that the state is one of anxiety merely tends to undermine the parents' confidence, and this in the treatment of behaviour disorders in children is completely fatal. It is essential always to work with the parent, and to present one's suggestions not only so that they will be accepted, but so that they will carry the conviction of soundness and truth. The word 'suggestions' is used advisedly, because to give advice in such cases is usually a bad policy. To tell a parent to change his methods of discipline or management is to attempt to impose one's will on the functioning of his parental instinct, and it is not possible to alter instinctive tendencies by force. The parent may, as a result of advice, consciously try to change, but the urge to follow the old plan will persist and percolate through his best efforts. The only way to ensure success is to demonstrate to him the facts upon which one's arguments are founded and to guide him to form his own conclusions. In this way the treatment methods are evolved by the parent himself, and so, being of his own thinking, they will be accepted and applied intelligently and with good will.

The fact that some intra-psyche tension exists is usually quite self-evident when the symptoms are of an active type. The excitability, over-activity, and exaggerated movements are evidence enough. It is more difficult, however, to see in the type where the response is timidity that there is in fact any tension present at all. The presence of tension in simple cases of enuresis may not be at all obvious in the general behaviour. If tension is present within the nervous system, it will be discovered in a physical examination; and in fact there are certain definite points which emerge both in the history and the examination of such cases which supply confirmatory evidence of its presence.

The child is often described as irritable and difficult. Not infrequently he eats voraciously, but is 'faddy' about his diet. He becomes very suddenly tired in the evening, which makes it imperative that he go to bed early. He wakes up correspondingly early in the morning, perhaps disturbing the household with his noise. In the case of young children it is found difficult to persuade them to take any afternoon rest. Play is of a violent, exaggerated, and noisy type, and parties are impossible on account of the excitement they produce. Sudden flushings, quick changes of colour, and profuse perspiration are common, the sweating being worse at night, and especially about the head and neck. Train or car sickness often occurs. Exaggeration of the normal fears, such as of the dark, of unknown places, or of traffic, is usually present, and there is intolerance of noise (except that made by the child himself) and an exaggerated dread of new experiences and strange people.

As regards treatment, it is essential that the tense child be given physical exercise, games, walking, playthings to work with, or dancing, but it is equally important that his brain should be exercised up to its full capacity. No harm is ever done by giving him school work to do, and the practice of keeping a child from school so as to rest his brain is always harmful. Many children who become tense have intelligence beyond their years, and they require all the education that can be given them. Some difficulty may be experienced in deciding just what is the proper curriculum for such children, and in this no general rule can be laid down. In some cases the adjustment need not be very accurately made, but in others, where the child is finely balanced or unstable, the most careful investigation of his mental capacities and the accurate assessment of his capabilities is necessary if treatment is to succeed.

It is difficult to say why certain children seem to tend to develop a state of tension more than others. Perhaps it depends on something in their endocrine constitution, or is due to special peculiarities in the nervous system. It would seem, however, at least in some cases, that the attitude of mind is acquired from the parents, and in practice one finds a very close association between the tense child and the anxious parent. Often the parent's anxiety is accentuated by the fear that the child is heading for a nervous breakdown, and his inability to curb the symptoms is an additional disturbance to his peace of mind. It must therefore be the first care of the physician to calm these fears, and if this is accomplished, treatment will be well begun. The very rapid improvement which follows adjustment of the child's daily routine will further strengthen the parents' confidence, and if carefully yet rigorously treated, many of these cases progress with such astonishing rapidity that the results compare favourably with almost any other condition the practitioner is called upon to treat.

If the state of tension has been severe, and has persisted for any time, it may be found that simple balance of production or output of energy is not sufficient to bring about a complete adjustment, because the child has been so far disturbed that a condition tantamount to a neurosis has developed. Here further treatment is necessary by some direct psychotherapeutic method.

The number of cases requiring such treatment is, however, comparatively small, and the practitioner can confidently apply the more direct and simple methods of adjustment, knowing that in a large proportion of cases nothing further will be necessary.

Emotional Factors in Intellectual Retardation.—E. Miller² is responsible for an important investigation on this subject. The central thesis of this contribution is: That as the result of treatment of retarded children, not only were emotional disturbances diminished, sometimes to a minimum, but that, parallel with this improvement on the affective side, there followed an improvement in actual application to school work and an improved score in mental tests. In other words, it allows one to argue that affective disturbances act in an inhibitory way on intellectual output. The series of cases which have been studied are, in the main, illustrations of arrest in the growth of the sense of reality engendered by affective disturbances. In the series under consideration, it was found as a result of study from the psychological, psychiatric, and the social points of view, that the mental arrest was circumstantial; that is to say, circumstances in the early life of the child had produced such affective preoccupation that the cognitive life stagnated because a more satisfactory *modus vivendi* was obtained by regressing to infantile forms of reaction, manifested in symptoms, behaviour, and above all in an unnatural preponderance of magical and animistic reactions to the external world. These latter tendencies were shown not only in behaviour and symptom (for that

would be only inferential), but directly from observing the child at play, in drawing, and in its soliloquies.

In studying a group of cases at an orphanage—children who were referred for behaviour disorders and neurosis, and in whom intellectual retardation was a constant feature—the writer was able to study subjects who shared a common deprivation, that is, the loss of one or other or both parents, and early separation from home conditions and ties. Of this series of 25 cases, roughly divided equally between girls and boys from age 7 to 14, all of whom were found to have a 20 per cent retardation in intelligence on the Binet-Simon scale—some being regarded educationally as still more retarded—16 were found to have a high degree of scatter tests, and in addition had very definite psychoneurotic symptoms and behaviour disorders. Owing to limitations in the conditions of treatment, the writer was unable to go to any depth into the phantasy life of most of them, but by careful handling and correcting certain environmental anomalies in their orphanage life, there has been in the 16 cases an appreciable improvement in intellectual output, parallel with an equally real improvement in the psychoneurotic and behaviour disorders. The writer feels he is justified in assuming, therefore, that in this series at least, a very important group of functionally retarded children has been defined, and that the functional retardation is a manifestation of the effects of affective inhibition of the cognitive life. The insult to normal emotional development as a result of orphanhood, considering this group alone, has produced retirement and a regression characterized by pseudo-intellectual deficiency. The paper includes an account of some of the writer's cases and the methods utilized in their treatment.

Behaviour and Personality Difficulties in School-children.—B. S. McFie⁴ contributes a paper on this subject. From the experience of the Department of Psychological Medicine at Guy's Hospital it was found that personality difficulties in school-children were drawn unduly from the group of active behaviour disorders or habit disorders of a type disturbing to parents. Personality deviations were not recognized at their full significance in all cases; they exist to a disturbing extent in children. The figure yielded by the survey, made in this paper by school teachers, of 46 per cent, must be taken as a considerable under-estimate, since many difficulties cannot be discovered by observations at schools.

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NEUROSES, OCCUPATIONAL.

H. Devine, M.D., F.R.C.P.

'Auto-drivers' Neurosis.—A. B. Jackson¹ states that in the past two years his attention has been brought to eight persons suffering from what he regards as a new disease directly attributable to one of the pleasures of modern civilization. For lack of a better name he has called this condition 'auto-drivers' neurosis'. It comes in the same group as writers' cramp and piano-players' paresis, both of which are functional neuroses.

Auto-drivers' neurosis is confined to the right foot and leg, and is, he believes, due to the regular and constant use of the foot in feeding gas to the car by way of the foot accelerator or pedal. The condition might be called 'accelerator neurosis' were it not for the fact that the right foot and leg do double duty in the driving act—namely, that of shifting from accelerator to brake pedal, both of which require a good bit of foot-play and pressure. 'Pedal neurosis' might therefore be considered as a descriptive title for the condition.

In the cases observed the symptoms in the main were about the same, with certain slightly varied modifications. In each instance the sufferer was a constant and habitual driver of an automobile. Three were professional chauffeurs, three were taxi drivers, one a business man who drove daily, making long and hurried trips, and the other was a physician. Thus comes the suggestion that the condition occurs as the result of habitual strain and is purely functional in type.

The first case which presented itself gave symptoms much like those which accompany arterial hypertension, in which we so often observe numbness, heaviness, and tingling sensations in the extremities due to spasticity of the blood-vessels. After taking the blood-pressure several times and finding it within normal bounds, the writer began to search for another cause, and finally he came to the conclusion that he was dealing with an occupational neurosis. As other cases came under his observation he was convinced that such was the fact.

In the main the symptoms are as follows: The patient complains of numbness, heaviness, and tingling of the right foot, which are inclined to follow up the leg to the knee. Relief is sought by rubbing the foot and leg, but as a rule with poor results. There may be some swelling of the foot and leg, pain often upon the dorsal surface of the foot, and in two of the cases observed a rather aggravating sciatica was noted which made the patient very uncomfortable. Strange to say, when these symptoms manifest themselves they become very stubborn and tend toward chronicity. Rest and relaxation may bring relief for a short period, but in several instances no benefit was derived therefrom. There is experienced the feeling of fear that the foot will lose its function, and the patient sits for various periods twisting and rotating the foot—as one described it, “trying to get life back into it.” In other words, the patient experiences a certain anxiety regarding the usefulness of the member and really becomes ‘foot conscious’.

Among the peculiar and varied symptoms noted are excessive sweating of the foot and leg, unusual coldness of both, and a tendency for numbness to linger in the little toe after it has disappeared from other parts. In one case an unsteady and uncertain gait was noted which caused a giving way of the right leg without warning, when the patient was walking. In two cases walking made the sufferers very tired, and they cannot walk far or long because of the inconvenience occasioned by the exhaustion and ‘weight’ of the foot, which tends to drag. The symptoms herein cited, together with the history of the case, should make diagnosis very easy.

The writer has found that the treatment of this condition is about as unsatisfactory as in other neuroses of this type, such as writers’ cramp. Rest is advised and should be maintained for some time, but it is difficult to persuade car drivers to pursue this course, especially when their livelihood makes driving imperative. Persons of wealth can employ a chauffeur, but for the vast majority this, of course, is neither practicable nor possible. Massage, followed by alternate splashing with hot and cold water, will give some relief even though it may be only temporary. The writer doubts if electricity does any good, but it may be tried for its psychic effect. Up to this moment he has seen no case completely cured, mostly owing to the fact that it is difficult to get complete co-operation from the patient.

Here is opened up a new field for the inventor, who should study out a method of driving a motor so as to give rest to the right foot in feeding gas. Of course the hand throttle mounted upon the steering wheel may be used, but on most cars it does not work easily enough to be practical. It has been Jackson’s practice to advise sufferers from this condition to use the hand

throttle to rest the foot, but they have soon found out that the strain was too great for the hand and arm muscles. His suggestion to the inventor is to place upon the steering wheel a hand lever which works easily and has on it a spring which acts to shut off the gas when the lever is released. Unquestionably something must be done to facilitate driving in such a way as to rest the right foot, for to-day almost everyone drives a car and makes himself subject to the very annoying conditions which the author describes. Specially built cars for those who are crippled offer a suggestion, and manufacturers may yet find it advisable to provide their stock cars with a double driving system which will give rest to tired muscles and thus avoid this new disease which threatens to become more general.

Neuroses in Deep-sea Divers and Others.—M. Culpin² contends that the occupational neuroses, including miners' nystagmus, conform to the conception of 'functional nervous disorders' in the narrow sense of the phrase. Specific difficulties in writers' cramp, however, are found to have symbolic significance to the patient. Cramp is frequently one symptom in a large syndrome. Both writers' and telegraphists' cramp reveal themselves as excrescences upon underlying psychoneuroses, though associated symptoms are often overlooked. Evidence is also brought forward suggesting that miners' nystagmus, which is supposed to be a physiological disorder that produces 'neurasthenia', is, in fact, mostly a psychoneurotic symptom. The author maintains that night-blindness is an hysterical symptom, and in his paper brings a considerable amount of evidence which would seem to support his contention.

Culpin gives a particularly interesting account of his investigations on the symptoms observed in those engaged in deep-sea diving. To increase the depth at which divers work, Sir Leonard Hill has invented a decompression chamber which the man enters on his way to the surface; his helmet is removed and he receives refreshment whilst the chamber is sealed and hoisted on deck, where decompression can be carried out at leisure, thus avoiding the danger of caisson disease. By this means a depth of 300 feet can be reached with safety. But unexpected things happened; some men carried out the deep diving successfully, others sent up erratic signals by telephone or life-line and on return to the surface claimed to have been unconscious. One man to whom that had happened demanded to be pulled up on another occasion before he reached his depth, and declared that he had seen his own face looking at him through the window of his helmet.

Physiological theory could not account for these happenings, and the Medical Research Council, when approached about the problem, suggested a psychological attack upon it. Culpin was asked to undertake this, and, with the assistance of Surgeon Lieut.-Commander Phillips, he examined half a dozen divers, of whom two had suffered this unconsciousness. From the first of these two, a well-built healthy petty officer, Culpin elicited the following symptoms: Always nervous of doing the wrong thing, even when being dressed for diving. "I don't like to attract attention in the street." Would not go into a strange tea-shop alone, would feel that everyone was watching him. Would rather go hungry. Never afraid of the dark, but of closed spaces—feels sealed in. The terror (his own word) came on first when skylarking, when other chaps fell upon him. Plays football and hockey. Useless in the water. "I don't like it." Would bathe in the sea, but not go out of his depth, yet has passed his swimming tests. Did quite well at ordinary diving; fear of being closed in came on badly once, but passed away. "It came on that time just before I went off on the bottom. That stirred it up and I've had it off and on since." Describing his dive, he said: "I felt dizzy at 40 [fathoms]; at 45 felt in a

nightmare. Felt like going under ether—that made me think of going unconscious. I had the feeling of being closed-in, and went off. When I came to daylight I came to my senses" (i.e., about 100 feet).

Then he described his second attempt, when he experienced various hallucinations and had to be pulled up. Culpin put him on a couch and directed him to go over the first descent and talk of it as if it were happening then. With some urging on his part he repeated the performance and recalled with hallucinatory vividness what seemed to be the whole of the period for which he had claimed unconsciousness. He cried out: "Pull me up, for God's sake, pull me up"; "I feel as if I'd never go up"; "I'm tied on the bottom. My mouthpiece is caught under my nose. It's getting lighter now. I can see the chamber." The writer states that the case is clear. The man was a claustrophobe and his "unconscious" was a state of Angst.

This and other cases made it possible for Culpin and Phillips to assure the authorities that the manifestations were not due to any defect in their physiological theory or practice. It was obvious, moreover, that the presence of a minor psychosis could have been recognized beforehand in the two cases investigated. This was being wise after the event, but the following year Phillips was still in medical charge of men selected for training in deep-diving, and decided to put his psychological experiences into practice. He 'vetted' five men and asked Culpin to vet them independently. They both agreed that one of them might readily fall a victim to the occupational neurosis, but for various reasons decided to let him carry on. The most important symptom in Culpin's view was a phobia of horses. The result of the dive to 300 feet is described by Phillips in a paper given to the United Services Section of the Royal Society of Medicine.³ The man demanded to be brought up, and emerged from the chamber in a state of collapse. Phillips decided to make the man abreact the experience, and the dramatic result is described in his account:—

"With sweat like a stream of water running down a face the colour of chalk, dilated pupils and rolling eyes, he went through all the emotions of the dive, sobbing and tearing at his clothes under the impression that he was again in his diving suit, and clawing at his face to pull off the imaginary face-glass. It was a picture of stark mad terror and the impression it left is very difficult to describe. No earthly power could then have got him near a diving suit." The interview lasted until about 10-30 (from 9-0) and when he had 'come to' again there was an immense improvement in his condition. The deep sigh which heralded the return to external consciousness was indicative of the dam which had been loosened.

Such abreaction Culpin regards as essential for the prevention of further symptoms after terrifying experiences. He has described a case⁴ in which the effects of a fright during compressed-air work were ascribed to caisson disease, and a severe psychoneurosis was allowed to develop which he believes a timely abreaction would have prevented.

In these three divers is illustrated the principle that, even in cases of acute onset, the symptom called into being by the occupation is not a primary condition.

REFERENCES.—¹*Med. Record*, 1934, cxxxix, Feb. 21, 174; ²*Proc. Roy. Soc. Med. (Psychiat. Sect.)* 1933, xxvi, 655; ³*Proc. Roy. Soc. Med. (United Serv. Sect.)* 1932, xxv, 1; ⁴*Lancet*, 1932, 1931, ii, 233.

NEUROSYPHILIS. (See SYPHILIS.)

NEUTROPENIA, IDIOPATHIC. (See BLOOD DISEASES.)

OBESITY.*Sir Walter Langdon-Brown, M.D., F.R.C.P.*

Hypertension and Obesity.—J. H. Musser and D. O. Wright¹ investigated a group of thirty obese hypertensive women and found a lowered sugar tolerance, whereas a second group of fat individuals without hypertension had no hyperglycæmia. They concluded that there was no one factor definitely responsible for the triad of obesity, hypertension, and hyperglycæmia, unless it was obesity. Reduction in weight is often associated with a lowering of the blood-pressure and a return of the sugar-tolerance curve to normal.

Dietetic Treatment.—E. C. Dodds² quotes Murray Lyon and Dunlop to the effect that 9 gr. of thyroid extract are required in order to produce a loss of weight equal to that caused by a standard 1000-calorie diet, and points out that it would be dangerous to employ thyroid extract in the treatment of obesity since a person who is habitually overeating might easily be taking 5000 calories a day, and if even 18 gr. of thyroid were given, their total energy balance would still exceed their requirements, and they would not appreciably lose weight. He recommends the following diet drawn up by Evans and Strang, which certainly does not seem to err on the side of laxity:—

Breakfast: 1 egg, 1 oz. bread.

Lunch: 1 egg, 4 oz. vegetables, as listed.

Dinner: 1 cup bouillon (if desired), 3 oz. lean meat (weighed after cooking), 4 oz. vegetables, as listed.

Acceptable vegetables: Lettuce, cucumbers, spinach, asparagus, endive, celery, mushrooms, tomatoes, brussels sprouts, watercress, cauliflower, radishes, cabbage, onions—very sparingly.

1. If the bread is eaten as toast, it must be weighed before toasting.
2. Eggs may be taken boiled, poached, or raw.
3. Meat may be boiled, broiled, or roasted.
4. No fried foods may be eaten.
5. No lard or butter may be used in cooking.
6. Vegetables must be prepared without milk, oil, or egg dressing.
7. Water may be taken as desired.
8. Salt, pepper, and vinegar (not lemon juice) may be used as desired.
9. It is just as important that all this be eaten as that nothing not on the list be taken.
10. Take a level teaspoonful of sodium bicarbonate in half a glass of water twice a day.

Y. Yoshida and I. J. Roberts³ have developed the dietetic treatment of obesity as advocated by Gordon, von Stanley, and Nissler, i.e., a diet of 1200 to 1400 calories with the addition of *dextrose* when there are symptoms of fatigue, hunger, nervousness, or weakness, the result of a falling blood-sugar. Their plan is as follows: The daily diet consists of clear soup, a liberal helping of 5 per cent vegetables, two or three pieces of bread and butter, one average portion of meat, two glasses of milk, and one orange. In addition the patient takes 30 grm. of dextrose daily in the form of 2-grm. pleasantly flavoured lozenges, one being dissolved in the mouth every half hour from 9.30 to 11 a.m., 2.30 to 5.30 p.m., and 8.30 to 9.30 p.m. The intake of liquids should be restricted to a total of not more than five glasses daily, and absolutely no food should be taken between meals except the prescribed dextrose. Moderate exercise in the form of walking is advised, but no severe gymnastic exercises.

J. H. Kenyon⁴ recommends a *high protein and vitamin diet*, even in the hypopituitary type.

Drug Treatment.—That certain dinitrophenols possess marked influence on metabolism has been known since the observations of Caseneuve and Lepine in 1885. But very little attention was paid to the subject until 1928, when Heyman and his co-workers showed that these substances greatly stimulate metabolism, increasing oxygen consumption, and if the administration be pushed, a rise of temperature terminating in a fatal hyperpyrexia. W. C. Cutting, H. G. Mehrtens, and M. L. Tainter⁵ describe clinical experiments with

2:4-dinitrophenol. Given in doses of 3 mgrm. per kilo. of body weight, it produces a rise in the basal metabolic rate without toxic symptoms, and they claim that it is possible in this way to reduce weight without simultaneous restriction of the diet. (See also M. L. Tainter, A. B. Stockton, and W. C. Cutting⁶ and I. M. Rabinowitch and A. F. Fowler.⁷)

E. C. Dodds and W. J. Pope⁸ describe a still more active substance, 4:6-dinitro-o-cresol, and the former in conjunction with J. D. Robertson⁹ investigated its clinical application. They found that a dose of 3 mgrm. per kilo. of body weight was far too great and speedily produced severe toxic symptoms, but that doses of 0.5 to 1 mgrm. per kilo. of body weight could be safely given over a prolonged period. When the basal metabolic rate exceeded + 50 per cent as a result of the drug, toxic symptoms, such as headache and discoloration of the conjunctivæ without true jaundice, developed. They call attention to the fact that this rise of basal metabolic rate was not accompanied by changes in the pulse-rate and blood-pressure such as occurs with the administration of thyroxine. The basal metabolic rate cannot therefore be deduced from Read's formula and should be measured directly.

In a later communication¹⁰ the same observers show that this and similar drugs are of no use in alleviating the symptoms of myxœdema, despite the fact that they are capable of causing an increase in the basal metabolic rate comparable to that produced by thyroxine. The relief of myxœdema and a rise of basal metabolic rate both result from thyroxine, while dinitro-o-cresol is only capable of affecting the latter. This suggests that dinitrocresol increases the basal metabolic rate in some way different from the normal metabolic process.

(See also POISONING—DINITROPHENOL.)

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, Aug. 5, 420; ²*Practitioner*, 1934, Jan., 54; ³*Med. Jour. and Record*, 1933, Sept. 16, 171; ⁴*Jour. Amer. Med. Assoc.* 1933, July 8, 97; ⁵*Ibid.* 1933, July 15, 193, Dec. 30, 2099; ⁶*Ibid.* Nov. 4, 1472; ⁷*Canad. Med. Assoc. Jour.* 1934, Feb., 128; ⁸*Lancet*, 1933, ii, Aug. 12, 352; ⁹*Ibid.* Nov. 18, 1137; ¹⁰*Ibid.* Nov. 25, 1197.

OBESITY IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

R. W. B. Ellis and K. H. Tallerman¹ very usefully call attention to the fact that obesity in children is often regarded far too seriously and that pathological labels are attached to the cases on quite insufficient grounds: and they are no doubt correct when they further suggest that the treatment of this condition is often vastly overdone. They record a study of a series of 100 children whose weights were 25 per cent above the average for both age and height. They divide their cases into endocrine, endogenous, and exogenous groups of obesity, and emphasize how frequently in practice endocrine factors are invoked without real justification. Obesity is known to be associated with diseases and disorders of the pituitary, hypothalamus, adrenals, and thyroid, and the authors particularly protest against a diagnosis of pituitary obesity unless some other symptoms of pituitary dysfunction can be found beyond mere increase in bulk. In their series they found no instance of organic disease of the pituitary, neither could they recognize statural or genital infantilism in any case, so that the diagnosis of Fröhlich's syndrome which had been made in most of their series appeared to them unjustified. Girdle distribution of fat was seen in both endogenous and exogenous cases, and was in no instance associated with delayed onset of puberty.

The authors admit, however, that in the production of the group which they label 'endogenous', there may well be endocrine factors which we are not able as yet to detect; and further, that it is impossible to exclude exogenous factors in many instances as additions to clear endogenous influences. For

instance, a family history of obesity, or obesity dating back to infancy (taken to prove the presence of endogenous factors), may perhaps be as well explained by familial overfeeding as by invoking more recondite family traits. It is therefore not improbable, as the authors admit, that in the so-called endogenous group of obesity we are really dealing with cases of mixed type.

TREATMENT.—The authors conclude that dietetic treatment should only be undertaken where the obesity gives rise to symptoms, and should never be sufficiently rigid to interfere with normal growth. Thyroid and pituitary preparations are contra-indicated in the absence of definite evidence of hypothyroidism or statural or genital infantilism respectively.

In the reviewer's opinion such sane advice as this is much needed at the present time. Amongst the well-to-do there is no doubt that obese children are far more frequently met than in former years in spite of the slim outline demanded by current fashions. Nevertheless, whatever psychotherapists may say, the average obese child is peculiarly happy, jolly, and popular at school. Such is its unconcern that it usually succeeds in remaining happy and prosperous in spite of the parents' solicitude. But in girls at a certain age the attitude changes, and if there has been no natural reduction in weight the child will herself make it her concern to see that it takes place by diminishing her diet.

Therefore, as Ellis and Tallerman emphasize, it is seldom wise to reduce the diet drastically in a happy well child who is free of any symptoms, merely because she is overweight; and in boarding-school life such a course immediately produces the stigma of peculiarity which is so undesirable for most children. Anything approaching serious underfeeding quickly reacts on the nervous system of a child, and produces irritability, despondency, lack of concentration, and deterioration in school work.

It is not uncommon at the present time to see in girls in their late teens quite serious results of slimming, usually self-imposed. The cases are curiously alike. They eat incredibly little, protesting total inability to eat more; they take long walks and deny that they ever felt better in their lives. Although they refuse to acknowledge that they are tired, they appear to be completely exhausted, with considerable emotionalism, slow pulse, and cold extremities. It is not easy to arrange for their cure. In most instances removal from home is necessary. It is hardly easy for a girl who for months has declared that a little fruit is all she needs, to sit down with the same table-companions and start eating ordinary meals. Where it can be managed, to send the girl on a cruise is the best and pleasantest way out of the difficulty, and it seldom fails. The pleasurable excitement, the new surroundings, the different food, and all the rest of it, tend to whisk the child out of herself, and improvement quickly sets in.

REFERENCE.—¹*Lancet*, 1934, ii, 615.

OBSTETRIC SHOCK. (*See LABOUR AND ITS COMPLICATIONS.*)

OCCUPATION NEUROSES. (*See NEUROSES, OCCUPATION.*)

ŒSOPHAGUS, AFFECTIONS OF. (*See also CARDIOVASCULAR DISEASE, CONGENITAL.*) *P. W. Watkyn-Thomas, F.R.C.S.*

Pouches of the Pharynx and Œsophagus.—In the Arris and Gale Lecture R. W. Raven¹ states that the 'acquired' posterior pharyngeal diverticulum is a prolapse of the mucous membrane of the pharynx in the weak area of the pharyngeal wall between the superficial and the deep parts of the crico-pharyngeus muscle; further, that the pharyngeal mucosa only herniates through this area. The upper part of the muscle is incorporated with the

pharyngeal constrictors and has its nerve-supply from the pharyngeal plexus; the lower, deeper part has a sphincteric action and blends with the muscle of the œsophagus. This part of the muscle, like the upper end of the œsophagus, is innervated by branches from the recurrent laryngeals.

Prolapse of the mucosa will be likely if there is either: (1) Degeneration or loss of elasticity of the muscles making up the lower pharyngeal constrictors; or (2) Spasm of the lower, or sphincteric, part of the cricopharyngeus with failure to relax during deglutition. Raven believes that this second factor is probably the more important. He also draws attention to the association of these pouches with goitre. The usual explanation is that this is due to the increased pressure on the œsophagus by the enlarged thyroid and consequent increased pressure on the pharyngeal wall from within during swallowing. Raven suggests that the motor nerves to the sphincter may be mechanically stimulated by the pressure of the enlarged gland, or that the excitability of the nerves may be increased by the deranged thyroid metabolism.

R. D. McClure² describes "without any recommendations" an operation for removing a *pharyngeal diverticulum by inversion and snaring*. He exposed and freed the diverticulum by a cervical incision, then passed a catheter into the sac from the mouth. The catheter was fixed in the sac by a stitch, and the sac was then inverted and pulled into the pharynx. The base was then stitched up through the neck wound. During the night the sac became so œdematous that the patient had considerable difficulty in breathing. Next day a tonsil snare was slipped over the sac, inside the pharynx, and the sac was cut off. The patient recovered without further trouble. McClure mentions another case in which freeing and fixing the sac without removal (diverticulopexy) resulted in a cure. He believes that, although one-stage removal has been very successful in some highly skilled hands, the two-stage operation should be the routine method. His 'inversion' method has only been tried in one case, and although there it succeeded, it has inherent disadvantages. In the discussion which followed Urban Maes agreed that in the hands of the average surgeon the one-stage operation subjected the patient to unwarranted risk. G. T. Vaughan suggested that one risk of the snaring operation was that the inverted mucosa edges might not come well together. [The tough submucosal layer which is the salvation of intestinal suturing is absent in the œsophagus, and this objection seems valid.—F. W. W.-T.]

H. J. Moersch and E. S. Judd³ summarize the histories of 276 patients with pharyngo-œsophageal diverticula treated at the Mayo-Clinic up to 1933. It was much more common among men than women (227 men, 49 women). The average age was 57. The average duration of symptoms was six years. In one case there was a carcinomatous change, and in four there was cardiospasm. Ninety-nine patients were not operated on, and of these three died before an operation could be done, one from apoplexy, one from starvation, and one from spontaneous perforation into the mediastinum with hæmorrhage. The total number of fatalities following operation is not given, but they were principally among elderly patients with concurrent diseases where operation was necessary on account of increasing dysphagia. There were two series, one of 57 and the other of 41 consecutive cases, without a death, which may be fairly taken as evidence of the comparative safety of the operation. Palliative methods are advised if the patient is old and the sac is small and giving little trouble. Palliative methods are essential as a pre-operative measure in all patients enfeebled by starvation and especially by starvation of fluid. The authors advise against gastrostomy, as in such cases the operation is dangerous. They let the patient swallow a thread and pass a tube over the thread into the stomach with the help of a special whalebone staff. The operation is done

under local anæsthesia, usually in two stages. At the first stage the sac is freed and sutured to the neck muscles. Eight days later the sac is exposed and removed, and the neck is sutured over. Small sacs are freed at the first operation but are not fixed for fear lest coughing or swallowing should rupture the neck. In some patients there has been a fistula from the œsophagus, but this has always closed without any further operation except the passage of bougies. They do not pass bougies as a routine after operation.

F. L. Lahey⁴ writes of 45 cases operated on for pulsion diverticulum without a fatality. He speaks of the condition as 'œsophageal' diverticulum. He operates in two stages and stresses the importance of high fixation of the sac. Unlike Moersch and Judd, Lahey believes in passing bougies in all cases at intervals for at least a year after operation. Œsophageal fistulæ are usually due to incomplete removal of the sac. He mentions several points which perhaps are not generally recognized:—

1. The recurrent laryngeal nerve is in danger at two places: (a) At the neck of the sac, where the nerve passes under the lower fibres of the inferior constrictor; (b) At the level of the inferior thyroid artery, which must often be divided before the deepest part of a large sac can be reached.

2. Excessive traction on the sac in 'delivering' it through the neck wound may cause angulation of the œsophagus, with subsequent difficulty in swallowing.

3. The importance of freeing the last muscle fibres off the sac, so that no spur is left.

Deviation of the Œsophagus in Pleuro-pulmonary Tuberculosis and in Collapse Therapy of the Lung.—V. Tantarri and M. Lucioni⁵ describe this condition. It is well known that quite small pleuro-pulmonary lesions can cause considerable displacement of the thoracic viscera. A good deal of work has been done on the consequent tracheal displacement, but the corresponding œsophageal deformity has hardly been recognized. The authors have found the condition to be quite common, and describe 21 cases, in 14 of which phrenectomy or artificial pneumothorax had been done. In most cases there is only a partial displacement at the upper part of the thoracic œsophagus, but nearly all the œsophagus may be affected. In pleuro-pulmonary tuberculosis the displacement is directly due to the fibrosis of the lesion; in pneumothorax the factors are the pull of the sound lung and the pressure of the gas in the pneumothorax cavity. At the end of the pneumothorax treatment the œsophagus returns to its normal position, or may be drawn over to the affected side. This condition may account for the dysphagia, nausea, and vomiting which sometimes follows pneumothorax collapse without any such causal condition as a pharyngeal lesion or toxæmia. There seems to be no relation between the tracheal and the œsophageal displacement.

Carcinoma of the Œsophagus.—At a discussion on recent advances in the treatment of carcinoma of the œsophagus⁶ Grey Turner pointed out that probably in most cases of œsophageal carcinoma there was a time when the disease was strictly localized; in all the five cases in which he had completed radical removal of the œsophagus there was no evidence of dissemination. In this paper he described a method of excision of the whole œsophagus by enucleation. First of all the abdomen is explored to exclude secondary deposits in the liver or the glands of the lesser curvature. A gastrostomy is then done. At the second operation the left lobe of the liver is detached from the diaphragm and turned to the right, which exposes the abdominal portion of the œsophagus. The peritoneum over the œsophagus is incised and the œsophagus is freed as high as possible by a finger through the hiatus. Next, the cervical œsophagus is exposed in the neck and ligated and divided as far down as possible, but at

least two inches above the growth. The upper end is brought out and sutured to the skin of the neck. Then the œsophagus is again approached through the abdomen, and freed until it can be pulled down through the diaphragm. Lastly, the œsophagus is cut off, the stump attached to the stomach is sutured, and the liver is sutured over the œsophageal opening of the diaphragm. One patient made a complete recovery, and nine weeks after the operation a series of operations were done to make an artificial œsophagus from an isolated loop of small intestine and a skin tube. The skin tube was connected with the stomach by the intestinal loop, and later the cervical fistula was united to the skin tube. Six weeks after the last operation the gastrostomy tube was removed, and since then the patient has taken all food by the mouth.

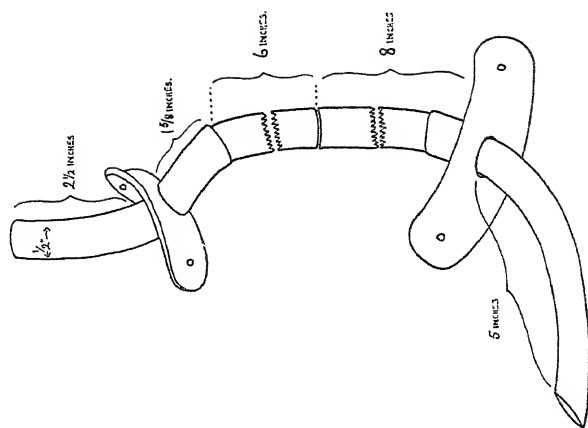
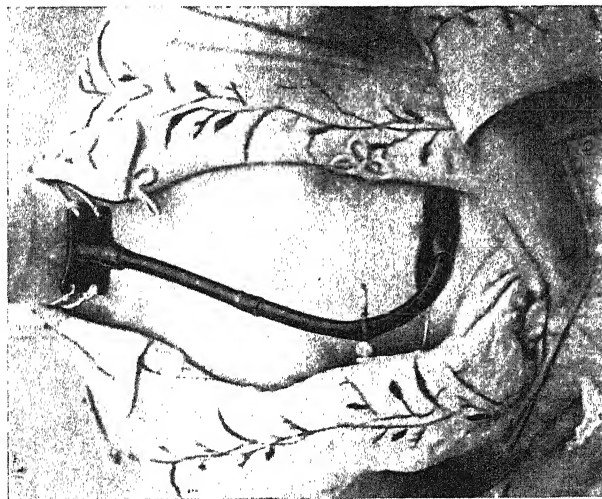
F. J. Cleminson and P. Monkhouse⁶ describe a series of cases treated by intra-œsophageal application of *radon*. They regard the results as so disappointing that they doubt whether it is not actually harmful to treat these patients by the application of radon to the centre of the growth, as the majority of their patients did not seek advice until peripheral extension and early metastases had made it impossible for radiation to reach the outlying parts of the growth with destructive strength.

W. M. Levitt⁶ said that the results of *X-ray treatment* of carcinoma of the œsophagus had been almost uniformly bad, in spite of the fact that the histological characters of the growths suggested that they should be radio-sensitive; also from 20 to 30 per cent of cases were reported at autopsy to be free from any metastasis. This failure was regarded as due to insufficient dosage, and a method had now been worked out by which it was possible to apply enormously increased doses to the œsophagus. The principle is to give large daily doses of X rays through multiple long narrow fields placed at intervals all around the chest wall. The fields are long (just under 7 in. on reaching the œsophagus) because of the well-known tendency of the disease to spread up and down in the submucous plane; they are narrow so that a large number of fields can be accurately directed upon the œsophagus. The treatment is carried out daily for from five to six weeks. Large doses of hard rays by a high-voltage apparatus are essential. When the paper was read 8 cases had been treated. In one the treatment had to be abandoned as the patient showed signs of pulmonary disease. All the others could now eat ordinary food, and in 6 of them no sign of growth could be found on X-ray examination with barium paste. All the cases, however, were recent ones, and only in one had œsophagoscopy been performed after treatment. In that one case the mucosa appeared to be perfectly normal.

Reconstruction Operations.—A. Evans⁷ describes a case in which, twenty-three years previously, he had provided a rubber œsophagus for a woman of 40 with an extensive carcinoma. He removed the larynx, part of the pharynx, the cervical œsophagus, and as much of the thoracic œsophagus as his fingers could reach behind the sternum, thus necessitating a permanent tracheotomy and a permanent gastrostomy. "The patient is alive and well to-day. She takes her food by mouth, masticates and swallows it, and no onlooker would guess there was anything unusual in the process—but an extrathoracic rubber œsophagus has replaced the normal one." (*Plate XXXVII.*)

In a case of impermeable cicatricial stricture caused by swallowing ammonia, in a woman of 27, reconstructive œsophagoplasty was successfully carried out by H. H. Sampson.⁸ The operation was done in three stages. In the first stage a subcutaneous skin tube was fashioned extending from the upper to the lower aperture of the thorax; two weeks later the cervical œsophagus was united to the upper end of this tube; and after another seven weeks the

PLATE XXXVII
RECONSTRUCTION OF OESOPHAGUS
(ARTHUR EVANS)



Tracheotomy tube and rubber oesophagus as worn by the patient.

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PLATE XXXVIII
RECONSTRUCTION OF OESOPHAGUS—continued
(H. H. SAMPSON)

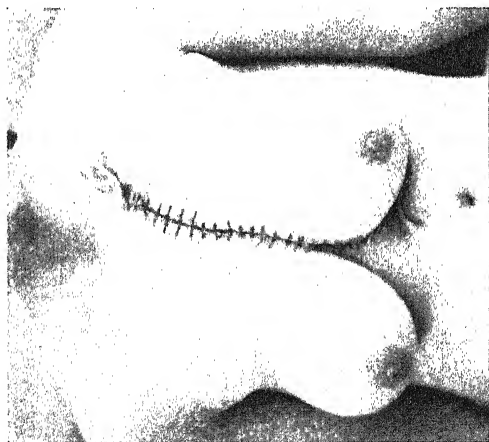


Fig. 4.—Photograph showing completion of first stage of operation. The gastrostomy opening is seen below the lower opening of the skin tube.



Fig. 5.—Photograph showing patient drinking. Active peristalsis is visible in the subcutaneous loop of jejunum.

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third stage was completed, the stomach being connected to the lower end of the skin tube by an isolated loop of jejunum. The patient now leads a perfectly normal life, eating and swallowing ordinary food. (Plate XXXVIII.)

REFERENCES.—¹*Brit. Jour. Surg.* 1933, Oct., 235; ²*Amer. Jour. Surg.* 1934, xxiv, 732; ³*Surg. Gynecol. and Obst.* 1934, April, 781; ⁴*Jour. Amer. Med. Assoc.* 1933, Sept. 23; ⁵*Rev. de Laryngol.* 1934, iv, 273; ⁶*Proc. Roy. Soc. Med.* 1934, Feb., 355; ⁷*Brit. Jour. Surg.* 1933, Jan., 388; ⁸*Ibid.* 447.

OSTEO-ARTHRITIS. (See RHEUMATIC DISORDERS, CHRONIC.)

PANCREAS, SURGERY OF. (See also HYPOGLYCEMIA AND HYPER-INSULINISM.)

A. Rendle Short, M.D., F.R.C.S.

Diseases of the pancreas are not frequently met with, or perhaps it would be more correct to say, are not frequently diagnosed. In forty-one years at so important a clinic as the Johns Hopkins Hospital there were only 158 operated cases. The results are given in the following table :—

IMMEDIATE RESULTS OF 158 OPERATIVE CASES OF PANCREATIC DISEASES
AT THE JOHNS HOPKINS HOSPITAL, 1891-1932.

IMMEDIATE RESULTS	DISEASES OF THE PANCREAS												TOTAL	
	Carcinoma of Pancreas		Chronic Pancreatitis		Acute Pancreatitis		Pancreatic Cyst		Pancreatic Abscess		Pancreatic Apoplexy		Adenoma of Pancreas	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Well ..	—	—	12	60.00	10	55.56	4	57.14	2	—	1	—	1	—
Improved ..	31	28.44	5	25.00	1	5.56	3	42.86	—	—	—	—	—	40
Unimproved	39	35.78	2	10.00	—	—	—	—	—	—	—	—	—	41
Dead ..	39	35.78	1	5.00	7	38.89	—	—	—	—	—	—	—	47
Total ..	109	100.00	20	100.00	18	100.00	7	100.00	2	—	1	—	1	—
													158	100.01

It will be observed that the only fairly common condition is carcinoma. The treatment followed for acute pancreatitis was free exposure and drainage; no mention is made of drainage of the gall-bladder. Some of the patients with chronic pancreatitis had jaundice; nearly all had pain, nausea and vomiting, and loss of weight. The usual treatment was to drain the gall-bladder or the common bile-duct. The figures are published by W. F. Reinhoff and Dean Lewis.¹

Acute Pancreatitis.—Most surgeons now regard exposure and drainage of the pancreas alone as inadequate, and advise that the gall-bladder also be drained (P. E. Truesdale,² J. Douglas³). Douglas points out that as large parts of the pancreas will probably come away as a slough, and also as secondary hæmorrhage is a real danger, the drainage of the pancreas should be very free, and hard tubes should not be used; rubber dam is better. His mortality was 50 per cent in 30 cases, but the virulence of the disease is so different in different patients that figures are of little value. Writers in former years have described a subacute variety of inflammation of the pancreas, which is not rare, and subsides of its own accord, and R. Elman,⁴ of St. Louis, presents a study of 37 cases with swelling and induration of the pancreas but with no necrosis, hæmorrhage, or suppuration. Only 4 were in his clinic, but in all an anatomical examination was made. There are usually a series of attacks of acute pain in

the epigastrium and through to the back. Biliary colic is often diagnosed, but a study of the pancreatic ferments, and the occurrence of glycosuria, may point to the true nature of the disease. In 14 cases the pancreas was exposed and drained and a cholecystostomy performed; all did well.

According to P. Brocq and J. Varangot,⁵ acute pancreatitis is often associated with hyperglycæmia. This may be of diagnostic value, and affords a hint that insulin treatment may be useful.

An article emanating from the Vienna clinic is contributed by P. Walzel.⁶ In the severe type of acute pancreatitis one should wait until the initial shock has passed off, and then operate, draining the gall-bladder, and incising any necrotic areas in the pancreas or abscesses close to it. In milder cases incising or gauze-packing the pancreas does more harm than good; drainage of the common duct is much better. Up to 1928 immediate operation on all cases was the rule, and 26 out of 30 cases died; since 1928, with delayed operation, only 12 out of 42 died (28 per cent).

Pancreatic Juice in the Bile.—H. L. Popper,⁷ of Vienna, finds pancreatic ferments frequently in the gall-bladder bile in cases of gall-stones and pancreatitis.

REFERENCES.—¹*Johns Hopkins Hosp. Bull.* 1934, June, 386; ²*New Eng. Jour. Med.* 1934, Jan., 66; ³*Ann. of Surg.* 1933, Nov., 909; ⁴*Surg. Gynecol. and Obst.* 1933, Sept., 291; ⁵*Bull. et Mém. Soc. nat. de Chir.* 1934, Jan., 25; ⁶*Wien. Med. Woch.* 1933, Dec., 1441; ⁷*Arch. f. klin. Chir.* 1933, Aug., 660.

PARAPLEGIA.

Macdonald Critchley, M.D., F.R.C.P.

The Management of the Paraplegic Patient.—The nursing care of an incurably paraplegic patient demands considerable skill and perseverance. Efficient nursing not only makes all the difference to the patient's comfort, but actually determines the period of survival. Post-war experience of cases of gunshot wounds of the spine has upset the older notions as to prognosis, for many ex-soldiers still live comfortable existences fifteen years or more after the onset of their paraplegia.

Two recent accounts of the treatment of paraplegic patients have been made by Col. Gowlland,¹ who as Commandant of the Star and Garter Home has had over 230 such cases under his control, and O. H. Gotch,² Superintendent of the Queen Alexandra Hospital for Paraplegia, Roehampton.

The chief points in Col. Gowlland's paper are as follows: In order to prevent ascending urinary infection, trained orderlies at regular intervals, daily or otherwise, wash out the bladder with mild antiseptic solutions. In the case of patients with permanent suprapubic openings, the tube is changed daily and another sterilized tube inserted and strapped to the abdominal wall. De Pezzer's and Malecot's suprapubic drainage tubes have been discarded in favour of the ordinary Jacques catheter No. 12. Two or three times a week (except in the case of patients with suprapubic cystostomies) the patient is bathed; that is, he is lifted from bed to his ward chair and wheeled into the bathroom, where his pyjamas are removed. He is then lifted into a very warm bath and washed. Afterwards he is lifted out of the bath—which is situated away from the wall so that an orderly can stand on each side—thoroughly dried, clothed, wheeled back, and lifted into bed again. Regular bathing is a most important measure in that it relieves the kidneys by producing sweating. On other days he may be given a radiant-heat bath, diathermy, or such other treatment as may be ordered to relieve the painful spasms of the legs. Morphia, hyoscine, and atropine are freely used to counteract these pains. Every day, ordinary nursing measures are carried out for the avoidance of bed-sores and trophic ulcers; the patient's back is thoroughly rubbed with methylated spirit; bony prominences are padded with sterilized Gamgee

tissue, secured by a many-tailed bandage; heels and ankles must be rubbed daily with methylated spirit and the heels protected from pressure by placing a small cushion under the Achilles tendons. The feet must be propped up by a firm bolster. Small cushions are placed under the knee-joints to prevent hyper-extension and a bed-cradle is used to take off the weight of the bedclothes. Massage to the legs, back, and abdomen is useful. Passive movements of the paralysed limbs are important in maintaining the circulation. By approximately 11.30 a.m. this treatment is concluded and the patient dressed and placed in his wheel-chair with rubber urinal adjusted. Numerous little devices and dodges are necessary to ensure comfort. The legs have to be placed carefully on the footboard and perhaps strapped to the chair on account of the involuntary flexion-spasms. The man is then taken down in the lift to the workshop, dining-hall, or exercise-room, or he may choose to go outdoors on his motor-tricycle. The patients retire fairly early, and subsequent toilet of the back is again carried out; the rubber day urinal is changed for a swan-necked bottle urinal. Orderlies visit the wards between 1 and 2 a.m. to remove, empty, and replace urinals. It is often found that involuntary and unconscious defecation has also occurred, and immediate attention is required. The patients are made to spend one or two days each week entirely in bed, on their so-called 'enema days'. They are given a slow, steady injection of 2 or 3 pints of saline solution into the colon. The bowel empties itself very slowly and the patient often has to remain for two or three hours upon a bed-pan. For this reason, special large-sized indiarubber air-cushioned bed-pans are employed. Various preparations are used to heal trophic ulcers. Ionization with T.C.P. solution or 1-100 zinc sulphate solution, red lotion, and strapping with elastoplast are frequently of service. Ointments are not regarded with favour.

Gotch emphasizes in his paper the value of an early suprapubic cystotomy. Drainage should be maintained indefinitely. The author believes that the prostate and prostatic urethra are the primary foci of infection in paraplegia. After a suprapubic opening is made, the urethral lumen becomes obliterated and the septic prostatic part shut off from the abdomen. Acute orchitis or septic vaginitis is perhaps a slightly more common complication in the suprapubic cases, but they quickly respond to treatment. The bladder must be irrigated with weak solutions of potassium permanganate and the tube changed three times in the twenty-four hours. A suitable non-irritating drug of the hexamine type is given, and an attempt made to keep the urine acid. The following prescription is recommended:—

R	Amm. Benzoat.	gr. xv	Syr. Aurant.	$\overline{3} \frac{1}{2}$
	Hexamine	gr. x	Aq. Chlorof.	$\overline{3} \frac{1}{2}$
	Tr. Hyoseyam.	℥xxx		
		t.d.s.		

Should this mixture prove too nauseating, such proprietary drugs may be used as amphotropin, velsalvine, or caprokol. Or hexamine and acid sodium phosphate, 1 gr. of each to 1 oz., may be taken in separate solution. Sacral bed-sores, frequent in the early months of a paraplegia, require hot fomentations until the granulating surface is free from pus. At this stage red lotion can be substituted. When healing is complete a dressing of unguentum sorbifaciens should be applied twice daily. For the severe pains in the limbs doses of nepenthe (15 to 30 min.) are most effective. Renal calculi can be demonstrated in probably all cases of over five years' standing, but rarely if ever give rise to colic.

The author has much that is interesting to say concerning prognosis. The first two or three years of a paraplegic's life are complicated by symptoms of sepsis from bed-sores and pyelocystitis. Patients with poor resistance will

tend therefore to succumb to conditions such as septicæmia, malignant endocarditis, hepatic abscess, perinephric abscess, empyema, or abscess of the lung. Or a latent condition such as pulmonary tuberculosis may be lit up and prove fatal. If the patient survives the first five years and begins his sixth year with healed bed-sores, non-purulent urine, and free from acute symptoms, there is then every likelihood of ten more years of paraplegic life. At the end of ten years the chances of death from sepsis are replaced by the dangers of a slowly progressing interstitial nephritis. All paraplegics of over ten years' standing show such evidences as raised blood-pressure, cardiac enlargement, tortuous brachial arteries, and albuminuria. From the tenth year onward, therefore, the cause of death is often cerebral hæmorrhage or uræmia due to an acute nephritis on top of a chronic contracted kidney.

In the author's experience the presence or absence of sexual potency is an important prognostic symptom. Though bladder function may remain in abeyance, and rectal control be defective, some restoration of sexual potency may occur; such cases do well. Of those complete paraplegics surviving for almost twenty years 75 per cent have recovered a certain measure of sexual activity.

REFERENCES.—¹*Med. Press and Circ.* 1934, Jan. 24, 81; ²*Practitioner*, 1934, cxxxiii, 76.

PARATHYROID GLANDS. (See also THYROID AND PARATHYROID GLANDS, SURGERY OF.)

Sir Walter Langdon-Brown, M.D., F.R.C.P.

Now that the association between hyperparathyroidism and generalized osteitis fibrosa is clearly recognized, it is not surprising that instances are rapidly accumulating. Till recently only 37 proven cases had been reported; now nearly 200 such cases are on record.

T. W. Mimpriess and R. W. Butler¹ report a case of hyperparathyroidism with unusual and interesting features. In the first place the patient was unusually young (17), while physically and mentally he did not seem more than 14. Secondly, his general appearance suggested renal rickets, and although renal function tests did not support this at first, his renal efficiency rapidly deteriorated. Thirdly, a tumour was found in and removed from, not the parathyroid, but the thymus, yet microscopically it was composed almost entirely of parathyroid tissue. Fourthly, the bony architecture returned completely to normal after operation, probably because the condition was treated at an age when active growth of bone is normally occurring. The failure of renal function was not associated with the formation of renal calculi; the authors are inclined to explain it on the basis of Hunter and Aub's observation of a marked rise of non-protein nitrogen in the blood following large doses of parathormone.

F. Allbright and others,² however, report a number of instances where renal function failed in hyperparathyroidism, and give a skiagram showing fine deposits of calcium in the collecting tubules of the kidney. They have also observed the resemblance in young subjects of hyperparathyroidism to renal rickets, but agree that the conditions are quite distinct biochemically. They are of opinion that almost all patients with hyperparathyroidism will eventually develop renal damage unless operated upon, and that while an alkaline urine should be avoided, a high phosphorus diet, though indicated for the demineralization, imperils the kidneys.

Max Ballin,³ in an interesting review of skeletal pathology of endocrine origin, contrasts the diffuse bony rarefaction of hyperthyroidism with the lacunar resorption in hyperparathyroidism which leads to a characteristic mottled appearance of the bone. In the former there is no elevation of blood calcium although the urinary calcium is greatly increased. After operation or administration of iodine, this increased excretion of calcium returns to normal. He, like Mimpriess and Butler, has found hyperplastic parathyroids

in relation to the thymus, and has found a very large thymus in a boy of 7 with typical osteogenesis imperfecta. He is of opinion that in children, at any rate, the thymus has some function influencing body growth. He also contrasts the bony overgrowths of acromegaly with the osteoporoses of pituitary basophilism. He is also inclined to associate an early surgical menopause, leading to loss of ovarian function, with decalcification of the skeleton. It will be noted that this is in sharp contrast with the former view that ovariectomy should be practised in cases of osteomalacia. When we find bony defects occurring in xanthomatosis, in splenomegaly with hæmolytic jaundice, and in the complete absence of bile from the intestines, it is clear that we shall have to extend considerably our conceptions of the factors which influence skeletal metabolism. In the absence of all bile from the bowel, vitamin D appears not to be absorbed; the presence of even a very small amount of bile in the intestines will rectify this.

R. Leriche and others⁴ have reproduced the skeletal changes of generalized osteitis fibrosa in rats by repeated injections of parathormone.

F. S. Hansman and F. W. Wilson,⁵ as the result of an elaborate study of calcium and phosphorus metabolism in diseases of the thyro-parathyroid apparatus, conclude that any excessive mobilization and excretion of these substances is entirely due to the parathyroids. Uncomplicated hyperthyroidism has no specific effect upon their metabolism, and they cannot confirm the thesis of Aub and of Hunter that thyroxin has a direct catabolic effect on the calcium deposits in the bones. They report two cases of hyperthyroidism associated with hypoparathyroidism in which calcium and phosphorus metabolism was maintained at the normal level. They consider that the beneficial effect of vitamin D in hypoparathyroidism is not due to better absorption of calcium from the intestinal tract, or to changes in the serum level of calcium, inorganic phosphorus, or the Ca \times P product. They suggest that vitamin D acts by making calcium available for tissue metabolism.

REFERENCES.—¹*Brit. Jour. Surg.* 1934, xxi, Jan., 500; ²*Amer. Jour. Med. Sci.* 1934, Jan., 49; ³*Ann. of Surg.* 1933, xcviii, Nov., 868; ⁴*Presse méd.*, 1933, Dec. 20, 2059; ⁵*Med. Jour. of Australia*, 1934, Jan. 13, 37, Jan. 20, 81.

PARATYPHOID FEVERS. (See also TYPHOID FEVER.)

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—In view of the rarity of paratyphoid A in England apart from travellers who have recently returned from abroad, the case reported by J. D. A. Gray and A. D. Gardner¹ is of interest. Their patient was a youth, aged 16, who contracted the disease without ever having travelled or having associated with travellers. The symptoms were typical of enteric fever and recovery was uneventful.

Faure-Beaulieu and Lévy-Bruhl² record the case of a man who on the fifteenth day of an attack of paratyphoid B developed left orchio-epididymitis without its having been preceded or accompanied, as is the rule, by pyelocystitis (see also MEDICAL ANNUAL, 1933, p. 331).

REFERENCES.—¹*Lancet*, 1934, ii, 21; ²*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1934, lviii, 809.

PARKINSONISM, POST-ENCEPHALITIC.

Macdonald Critchley, M.D., F.R.C.P.

TREATMENT.—Two useful papers on this subject have appeared by A. F. Hurst¹ and A. J. Hall.²

In the former the author advocates increasing doses of *stramonium* or *hyoscine*, to which *pilocarpine* is added in order to overcome some of the disagreeable

side-effects. At first the patient is given 10 min. of tincture of stramonium in half an ounce of water on waking, after lunch, and after tea. If stiffness causes disturbed nights, by preventing the patient from turning over in bed, an extra dose may be taken before retiring. One drachm is added to each of the three doses on alternate days, so that in eight days the dose is doubled. This gradual increase is continued until the patient complains of blurred vision and excessive dryness of the mouth. Pilocarpine nitrate, $\frac{1}{10}$ gr., is then added to the last dose of stramonium, and the mixture is again made up to half an ounce of water. Once more, 1 drachm is added to each of the three doses until sufficient relief is obtained or slight toxic symptoms appear. In this way at least 60 min. of the tincture of stramonium can be given in each dose, together with perhaps $\frac{2}{3}$ gr. of pilocarpine. At the same time, vigorous psychotherapy in the form of explanation, persuasion, and re-education with the aid of a friendly but strong-willed nurse or companion is essential to combat the associated mental lethargy. For the so-called "reversal of the sleep rhythm"—characterized by nocturnal restlessness and diurnal drowsiness, Hurst recommends caffeine and/or ephedrine by day and luminal or medinal at bedtime.

A. J. Hall also advocates drugs of the atropine series, belladonna, hyoscyne, or stramonium. Increasing doses are usually required. Hyoscyne may usefully be given as an injection, in doses of $\frac{1}{100}$ to $\frac{1}{50}$ gr. The author rather favours belladonna, commencing with doses of 10 min. of the tincture. Treatment of the oculogyric crises is disappointing, though attempts have been made to produce relief either by means of cerebral stimulants—caffeine, strychnine, ephedrine—or, conversely, by sedatives.

REFERENCES.—¹*Lancet*, 1934, March 10, 499; ²*Practitioner*, 1934, cxxxiii, July, 26.

PARONYCHIA. (See SKIN. FUNGUS INFECTIONS OF.)

PATENT INTERVENTRICULAR SEPTUM.

Reginald Miller, M.D., F.R.C.P.

Continuing their investigations into this subject (see MEDICAL ANNUAL, 1934, p. 340) D. C. Muir and J. W. Brown¹ present a study of 40 cases of patent interventricular septum. They are able fully to confirm the usual opinion that this particular form of congenital heart deformity, existing alone, is symptomless and free of danger; and that it is only when it is misinterpreted and regarded as something serious that the child is harmed by it. It is therefore of moment that this particular heart lesion should be accurately recognized, and fortunately this is not difficult.

The characteristic murmur was accurately described by H. Roger² as long ago as 1879, and the condition is often known as the *maladie de Roger* in compliment to the full and correct description of this type of congenital heart disease which he then gave. The murmur is harsh and loud and occupies the whole of systole; it is heard close to the left border of the sternum with its point of maximum intensity usually in the third or fourth space, but occasionally a trifle lower than the fourth space. In about one-third of the cases a thrill can be felt corresponding to the area of maximum intensity of the bruit. The thrill may only be felt in some instances with the patient lying on his face. The thrill and murmur are similar in character and time to those of congenital pulmonary stenosis, but their position, as judged by the areas of maximum intensity, is lower down than the pulmonary area, as already detailed.

There are no symptoms which can be properly attributed to this malformation. Cyanosis, dyspnoea, and clubbing are all absent. It is true that in some cases it is not easy to be sure of the absence of shortness of breath. It is to be supposed that every doctor that has ever examined the child's chest has

asked the mother if there is shortness of breath or blueness, and not unnaturally in the course of time some mothers will be prepared to complain of their presence. On the other hand, it must be remembered that other congenital lesions may accompany patent interventricular septum, and that these added lesions may provide not only symptoms but considerable danger.

With these considerations kept in mind it is safe to say that patent septum (like patent ductus arteriosus), when existing as a solitary lesion, is harmless and presents no reason for invaliding the child in any way.

There is no characteristic radiological picture to be recognized in this type of congenital heart disease.

REFERENCES.—¹*Arch. of Dis. Childh.* 1934, ix, 27; ²*Bull. de l'Acad. de Méd.* 1879, viii, 1074.

PELLAGRA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Pellagra among Sudanese millet-eaters is reported on by N. L. Corkill¹ in the northern desert Arabs. The most severe cases occurred in the older women, and the maximum incidence in the hot dry season, when the milk-supply of proteins, vitamins, and cholesterol is nearly absent. The pigmentation is considered to be allergic and protective in nature, and the symptoms are thought to be caused by cholesterol and vitamin A and D deficiency, and cereal toxic effects of the millet which forms the staple diet. Pellagra in the Hyderabad Deccan, India, is further reported on by J. Lowe,² where he was able to observe the earliest symptoms in leprosy patients. These consisted either of dermatitis in the form of an erythematous patch on the dorsal surface of the base of the thumb and first finger, or of a glossitis with characteristic enlarged red papillæ on the margin of the tongue. The addition of $\frac{1}{2}$ lb. of meat a day, and at least 60 gr. of yeast three times a day, to the ordinary rice and dal diet proved effective and prevented any deaths occurring.

REFERENCES.—¹*Lancet*, 1934, June 6, 1390; ²*Ind. Med. Gaz.* 1933, July, 379.

PENIS, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Circumcision and Syphilis.—It is commonly believed that the incidence of acquired syphilis is lower in the circumcised. Sir Jonathan Hutchison, in 1854, wrote, "The circumcised Jew is very much less likely to contract syphilis than an uncircumcised person". V. E. and N. L. Lloyd,¹ after a careful inquiry, find there is a negligible disparity in the frequency with which the circumcised and the uncircumcised are attacked by syphilis.

Priapism.—The causes of persistent priapism are either nervous or vascular. Thrombosis of the corpora cavernosa leads to the formation of a hard swelling of the whole organ except the glans. If clotting is more extensive in one corpus, deviation occurs. C. Morson² says there are three diseases which may lead to clotting of blood in the cavernous spaces. They are malignant disease of the left kidney, lymphatic leukaemia, and arteriosclerosis. He records two cases of a thrombosis of the penis secondary to arteriosclerosis.

Priapism as a complication of leukaemia is mentioned so regularly in text-books of medicine that its frequency is undoubtedly exaggerated. L. F. Craver³ observed one case only of priapism in a series of over one hundred males suffering from leukaemia. Following X-ray treatment of the spleen the priapism subsided rapidly. The corpora cavernosa were aspirated, but Craver considers that this had probably little to do with the result.

Impotence usually follows persistent priapism, and may be permanent or last for several months.

Carcinoma of the Penis.—This condition is practically unknown amongst circumcised Jews; curiously, it is also exceedingly rare amongst negroes, who

are particularly liable to phimosis. F. L. Hoffman⁴ produces overwhelming evidence that penile cancer is extremely frequent amongst the Chinese and the inhabitants of the Federated Malay States. It also occurs at an earlier age in the Chinese than it does in Westerners. S. K. Ngai,⁵ after an exhaustive investigation, can find no tangible reason why Chinese are particularly liable to this form of cancer. In England and Wales the disease is moderately uncommon—for example, in 1930 there were 162 deaths recorded from this cause.

TREATMENT.—A. B. Hepler⁶ is emphatic that if a case of carcinoma of the penis is to be cured, a block dissection of the fat, fascia, and lymphatics of the lower abdominal wall, the inguinal regions, and the thigh to below the saphenous opening should be carried out in all but the very earliest cases. Whether a complete or partial amputation is to be performed will be determined by the degree of involvement. Amputation two inches proximal to the border of palpable induration is sufficient. Emasculation is unnecessary.

REFERENCES.—¹*Brit. Med. Jour.* 1934, Jan. 27; ²*Ibid.* Aug. 11, 249; ³*Surg. Clin. N. Amer.* xiii, 427; ⁴*New Eng. Jour. Med.* 1933, Nov. 30, 1093; ⁵*Amer. Jour. Cancer*, 1933, xix, 259; ⁶*Surg. Clin. N. Amer.* 1933, Feb., 53.

PERITONITIS.

A. Rendle Short, M.D., F.R.C.S.

TREATMENT.—The local use of *protective serum* in the peritoneum continues to interest Central European surgeons, and there are again a number of articles on the subject. F. Prochnow,¹ of Budapest, has reduced the mortality from 18.45 per cent in cases of appendicitis-peritonitis treated by operation alone to 12 per cent when a mixed horse-serum containing *B. coli* and anaerobe antitoxins was used as well as operation, and to 9.67 per cent when a cattle-serum, obtained by inoculating one animal with *B. coli* and four anaerobes, was substituted. The convalescence was materially shortened. S. Zimmer,² of Berlin, advises that cases of appendix-peritonitis should be operated on, and the peritoneum swabbed with rivanol; if the pus smells of *B. coli*, 25 to 50 c.c., of coli-serum should be passed in before closing the abdomen. After operation, 25 c.c. of coli-serum is to be given intravenously and 50 c.c. intramuscularly, to be repeated daily if improvement is not marked. If the pus contains streptococci, an anti-streptococcus serum should be added. The mortality has been reduced by these measures from 30 to 20 per cent. R. Riemann³ says that at Frankfort the death-rate has been reduced from 20 to 4.3 per cent by using *B. coli* or peritonitis serum in the peritoneal cavity.

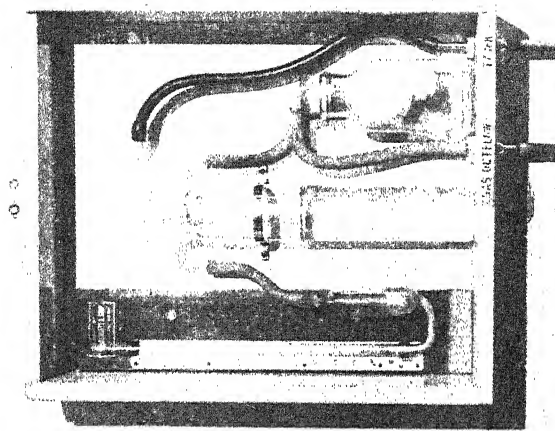
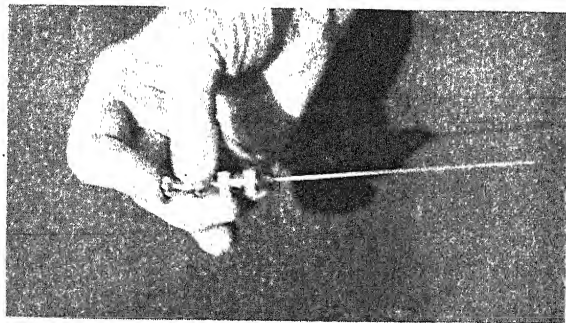
A. J. Trineca,⁴ of Sydney, writes *against the use of drainage tubes* for every variety of peritonitis, the only exception being the occasional case in which the source of infection, such as perforated ulcer or gangrenous appendix, cannot be removed. Tubes only make for complications, and the peritoneal cavity is much too complicated for drainage to be effectual. It is not necessary to remove peritoneal exudate. Care must be taken to touch the intestines as little as possible and avoid all roughness, and gauze packs are too damaging to the endothelium. Only 6 out of 244 cases died; the great majority were patients with gangrenous appendicitis.

According to T. G. Orr,⁵ of Kansas, *morphia* and its allies in full doses, sufficient to make the patient sleep, stimulate the tone, rhythmic contractions, and to some extent the peristalsis of the small intestines for at least six hours. It is therefore definitely indicated for patients with peritonitis or intestinal obstruction, as it controls distension and prevents disturbances of bowel circulation. His observations are confirmed by the experiments of a number of workers (Plant and Miller, Gruber and Robinson, Dvorak) using dogs, and observations of humans with a thin-walled hernia. This is the exact opposite

PLATE XXXIX

PNEUMOPERITONEUM IN TUBERCULOUS PERITONITIS

(I. P. STEIN)



Needle used for trans-abdominal pneumoperitoneum, and insufflation apparatus.

of what is generally taught. The constipating action of morphia is attributed to its spastic affect on the sphincters and to reduced intestinal and pancreatic secretions.

E. H. Mensing,⁶ of Milwaukee, describes two stages of peritonitis, the first being characterized by bacteriæmia and toxæmia, and the second by distension with circulatory disturbances and inhibition ileus. In treatment, fluids should only be given by mouth if duodenal suction by intubation is going on. Enemata and proctoclysis are wrong in the early stages, when rest of the large bowel is required; morphia is good. The Fowler position is valuable in the early stage, and the author advocates mild X-ray treatment also to raise the anti-bacterial defences. Drainage is useless. In the early stage fluids and chlorides are called for to replace loss by vomiting, and if shock appears a 6 per cent acacia solution with pitressin in small doses should be used. Splanchnic vasomotor paralysis is to be treated by small doses of ephedrine, and distension ileus by hypertonic intravenous saline.

Tuberculous Peritonitis.—The value of *oxygen insufflation* has been referred to from time to time in the MEDICAL ANNUAL, and the reviewer has used it with success in a number of patients. I. F. Stein,⁷ of Chicago, mentions six cases of his own which all did well. About a litre is introduced by means of a needle. The apparatus used is shown in *Plate XXXIX*. No anæsthetic is needed. If an X-ray is taken, valuable evidence may be obtained as to the existence of adhesions, and if combined with utero-salpingography the origin in tuberculous tubes may be demonstrated.

REFERENCES.—¹*Arch. f. klin. Chir.*, 1934, March, 229; ²*Ibid.* 1933, Aug., 726; ³*Munch. med. Woch.* 1933, Nov., 1886; ⁴*Med. Jour. of Australia*, 1933, Oct., 465; ⁵*Ann. of Surg.* 1933, Nov., 835; ⁶*Amer. Jour. Surg.*, 1933, Dec., 478; ⁷*Surg. Gynecol. and Obst.* 1934, March, 567.

PERITONITIS, PNEUMOCOCCAL. John Fraser, Ch.M., F.R.C.S.Ed.

To anyone who has followed the recent reviews of pneumococcal peritonitis as presented in the pages of the MEDICAL ANNUAL it is apparent that there has been an increasing tendency to advise conservative treatment in the early stages of the disease. The problem is debated by M. Loutsch and M. Mèrigot¹ in a paper entitled "Is it Necessary to Operate on Pneumococcal Peritonitis?" They give brief clinical histories of 10 cases, all of which were operated on, the ultimate mortality being 40 per cent. They point out that, while willing to accept the contention that operation should be postponed until localization of the infection has occurred, they were forced to operate on account of the dubiety which surrounded the question of diagnosis. They hold, too, that while the clinical picture of pneumococcal peritonitis may present various suggestive features, there are none sufficiently constant and definite to form a basis for diagnosis. The proper and pertinent question is then asked, Assuming that the pre-operative diagnosis is necessarily uncertain, is operation in a positive case unnecessary and even dangerous? Loutsch and Mèrigot answer the question by describing the procedure adopted; it is that of exploring the right iliac fossa by means of a small incision in order to verify the diagnosis, and, if the diagnosis of a pneumococcal infection is confirmed, of inserting a large drain into the pouch of Douglas.

S. D. Terkovskiy² is satisfied that the disease takes one or other of two different forms: it is either acute in its onset and general in its distribution, in which case death occurs within a period of a few days, or it is subacute in its beginnings, with a tendency to localization in its future course. He believes that in so far as the first group is concerned no local treatment is of any avail, his experience being that the mortality is 100 per cent; in the second group

local measures are delayed until encapsulation is complete, when a simple incision with or without the use of a drain is followed by a cure in a high percentage of the cases.

W. Budde³ attaches great significance to the leucocyte count as a means of diagnosis. He has found that pneumococcal peritonitis is apt to be associated with a count as high as 30,000, and upon such readings he has made an accurate diagnosis. It is his conception that the disease may be visualized as beginning with an intense general infection, which at the end of two or three days is associated with a more localized manifestation in the peritoneal cavity. In favourable cases there is a further degree of circumscription, so that the eventual issue is nothing more or less than a circumscribed abscess. Budde supports the view that operation should be delayed until at least some measure of localization has been reached, and this may be said to represent the majority opinion at the present time.

REFERENCES.—¹*Presse méd.* 1934, March 13, 517; ²*Sovetskaya Klinika*, 1933, xviii, 193; ³*Arch. f. klin. Chir.* 1933, Dec., 308.

PERNICIOUS ANÆMIA. (See ANÆMIA, PERNICIOUS.)

PERTUSSIS. (See WHOOPING-COUGH.)

PHARMACOLOGY AND THERAPEUTICS. (See also HYPNOTICS.)

Ivor J. Davies, M.D., F.R.C.P.

Progress in Autopharmacology.—Sir Henry H. Dale¹ delivered the Dohme Memorial Lecture at the Johns Hopkins University School of Medicine on this subject, and surveyed the present knowledge of the chemical regulation of certain functions by natural constituents of the tissues. The purpose of the Dohme Lectureship is "to promote the development of a more intimate relationship between chemistry, pharmacy and medicine".

Histamine.—Dale reviewed the history of the knowledge of histamine, which can now be said to be a natural constituent of the living cells of most organs and tissues of the body. He referred to the work of Sir Thomas Lewis and his co-workers, showing that the local vascular reaction to irritation or injury is evoked by a chemical stimulus. These studies have been assembled by Lewis in his book on *The Blood-vessels of the Human Skin and their Reactions*. Early in their course, Lewis had become convinced that the threefold reaction of the skin vessels following all kinds of local irritation or injury—localized capillary dilatation, oedema similarly localized, and a reflex arteriodilator flush in the surrounding area—could only be explained by the appearance in the immediate neighbourhood of the affected epidermal cells of a substance causing all these effects.

Some years before, Sollman and Pilcher² had demonstrated that histamine, among other substances, produced capillary dilatation and whealing when introduced into the human epidermis. Dale suggested to Lewis that histamine could be tried in such a connection, and close resemblances were traced between the effects of all types of injury and those of histamine in high dilutions introduced by light punctures into the epidermis.

There is now excellent evidence that something acting exactly like histamine can escape into the general circulation and produce its typical effects at a distance, in response even to a very mild trauma of tissues like the epidermis, which are rich in that base. When we look at the more recent evidence as a whole, it does not appear to weaken the case for histamine as a chemical stimulant concerned in normal vascular and other bodily reactions.

Acetylcholine.—The natural occurrence and probable function of acetylcholine was next considered. Dale was led to examine its action through the accident of its occurrence in a particular ergot extract. He emphasized the remarkable fidelity with which it reproduced the effects of stimulating parasympathetic nerves—a resemblance comparable to that between the actions of epinephrine and its effects on true sympathetic nerves. The almost unique intensity, combined with the evanescence of its action—the latter, as Dale predicted, due to rapid hydrolysis by an esterase in the blood—led him to suggest that acetylcholine would be admirably fitted to play the part of a parasympathetic hormone, if only there were any reason to suppose that it actually occurred in the animal body. He next reviewed the humoral mechanism of Lewis's threefold vascular reaction to skin injury in man in the light of physiological evidence described in detail in his lecture. Histamine, liberated from epidermal cells by the changes following injury, will cause dilatation of the minute vessels lying immediately under the area injured, and local œdema by alteration of their permeability; at the same time, impulses starting from the sensory nerve-endings, initiated either directly by the mechanical injury itself, as Lewis suggests, by the action on them of the liberated histamine, will pass through the axon, branching down the side branch to a neighbouring arteriole, where liberation of acetylcholine will cause arterial dilatation and produce the irregular flush surrounding the immediate injury reaction. So the intervention of these two substances, liberated by entirely different mechanisms, at different parts of the vascular branching, would suffice by itself to account for the general features of the local vascular reaction to mildly injurious stimuli in certain species.

Adenosine.—Adenosine and its derivatives were next discussed. On present evidence Dale accepted the view that the effect of the adenosine compounds in the blood-vessels is essentially to produce arterial dilatation. Their depressor action is very much weaker than that of the substances, histamine and acetylcholine, with which he had already dealt. It appears, rather, to be of the relatively weak order of that produced by free choline. This relative weakness, however, does not affect the possibility that these substances, present in such quantities as they are in certain tissues, may contribute significantly to natural vasodilator effects. As regards their distribution, this seems to be pretty general in the important organs; but those containing it most abundantly, according to Bennet and Drury,³ are the cardiac and voluntary muscles, the liver, and the kidney.

There is one action of adenosine, mentioned by Drury and his colleagues, which may well be of significance in connection with certain reactions to injury—namely, its power of inducing a leucocytosis. The fact that histamine has not this effect has always prevented the allotment to it of more than a partial function in a vascular response to injury severe enough to be classed as inflammatory. Whether the combined effects of histamine and adenosine will suffice to account for the whole of a local reaction to injury, more severe than that required to liberate histamine alone, must be decided by further study.

Kallikrein: Vasodilators from Blood-vessels, Blood, Intestine, and Brain.—A general survey of the possible functions of such constituents of the tissues, in relation to those of nerves and specific hormones, was then made. The highly active vasodilator substance to which Frey and Kraut gave the name 'Kallikrein' was first obtained by them from normal urine. It differs from all the other substances in its complexity and instability. It will not dialyse through parchment, and it is inactivated by boiling. It resembles in these respects some of the more complex hormones rather than the simple

constituents of ordinary tissue extracts; and we shall see that something like a true hormone function has been attributed to it.

Dale concludes a highly important and authoritative contribution as follows: Pharmacy, as the expert supply service of therapeutics, will have to wait until the effect of this autopharmacology on therapeutic practice has more fully disclosed itself. It may well be that it will influence therapeutics more by the light which it may eventually throw on the causes of abnormal conditions, than by directly providing materials for their treatment. There are already plenty of tissue extracts available with claims for their value in relieving a generally high blood-pressure or a vascular spasm in particular organs; but it is to a completion of our knowledge of the active substances which they contain, of the details of the action of each, and of the relation of such actions to the physiological changes in the living body, that we must look for the development of "a more intimate relationship between chemistry and medicine", and eventually between them and pharmacy, in this important field.

Charcoal.—G. H. W. Lucas and V. E. Henderson⁴ (Toronto) have for several years been in the habit of recommending the use of charcoal as a temporary antidote in cases of *poisoning*, but in practice they found no charcoal of which they could be certain. Finally, a sample of German medicinal charcoal was obtained. This had such valuable adsorbent properties *in vitro* that they were led to suggest its inclusion in the Canadian Formulary. They refer to the clinical work of Adler,⁵ who used an excellent medicinal charcoal in some 50 cases of poisoning. In 21 cases where death would presumably have occurred, the administration of charcoal saved the patient. These include 7 cases of poisoning with phosphorus; 3 with morphine; 2 with corrosive sublimate, potassium chlorate, and lysol; 1 with arsenic, veronal and pantopon, absinth, mercury; and 2 with some unknown food substance. In his clinic, too, treatment of *gastro-enteritis* and *acute enteritis* with charcoal resulted in a rapid disappearance of the symptoms. The quantities given were small, 3 gm. two to three times daily, or sometimes 5 gm. twice daily. Lucas and Henderson recommend that in cases of poisoning at least four to five teaspoonfuls of the charcoal mixed with a glass of water be swallowed as speedily as possible. If necessary, it may be administered by means of a stomach tube. As soon as convenient the stomach should be emptied by vomiting or by siphoning or pumping off the contents with a stomach tube. If the stomach cannot be emptied in this manner, more charcoal, mixed with ample saline purgative, should be given in order that the stomach contents may be so hurried through the intestinal canal that very little poison will be adsorbed. Even if the stomach has been emptied, this procedure is of value (Adler).

Iron.—G. N. Burger and L. J. Witts⁶ (London), in 10 cases of *anæmia*, have carefully tested the injection of iron introduced into the British Pharmacopœia in 1932. The parenteral administration of iron is rarely desirable, because the therapeutic dose of iron by injection is so near to the toxic dose. *Injectio ferri* B.P. has a very low therapeutic efficiency owing to its small content of iron; it is also painful, though this may be corrected by the addition of a local anæsthetic such as 3 per cent procaine hydrochloride. Double the maximum official dose of *injectio ferri* B.P., i.e., 14 mgrm. of metallic iron, can apparently be safely given at one injection, but it would be necessary to give this dose twice a day for about six weeks to equal the effects of large doses of iron by mouth. The treatment of *anæmia* by weekly or bi-weekly injections of small doses of iron is irrational and to be deplored.

(See also *ANÆMIA*, *PERNICIOUS*.)

Morphia Substitutes.—G. N. Myers⁷ (Cambridge) has investigated the pharmacological action of some new substitutes for morphine and heroin.

During the past few years three new synthetic drugs have been manufactured and extensively used on the Continent as substitutes for these drugs. They are being manufactured in Germany, and are marketed under the trade names of 'dilaudid', 'dicodid', and 'eukodol' respectively.

Dilaudid is chemically the hydrochloride of dihydromorphine. The drug is marketed as a substitute for morphine, and the makers claim for it an analgesic action and a quieting effect on the respiration.

Dicodid has dihydrocodeinone as its basis. It is advocated as an analgesic and as a sedative of the respiratory tract.

Eukodol is the hydrochloride of dihydroxycodone. It is used as a respiratory sedative and as an analgesic.

Myers summarizes the results of his experiments thus :—

1. Dilaudid, dicodid, and eukodol have an action on the respiration which is similar to that produced by morphine. They have little or no effect upon the bronchioles.

2. These drugs produce marked analgesia.

3. Dilaudid and dicodid have a marked action upon the tone and movements of the alimentary canal. This effect is very much less marked with eukodol.

4. Small doses of dilaudid or dicodid render the vagal centres in the medulla more sensitive; larger doses depress. Eukodol depresses the centre, even in small doses.

5. Toxic doses of dilaudid or dicodid increase the reflex excitability of the cord. Eukodol does not alter these reflexes.

6. The toxicity of dilaudid and eukodol is much greater than that of dicodid. Anæsthetized cats can withstand enormous doses of these drugs provided that they are administered after a smaller therapeutic dose. An initial large dose causes death from respiratory failure.

7. These drugs have only a negligible action on the cardiovascular system. Dilaudid causes some slight slowing of the heart, which is central in origin.

Oxygen and Carbon Dioxide Therapy.—A. M. Burgess, A. S. Briggs, and A. M. Burgess, jun.^s (Rhode Island Hospital), describe an open-box method of oxygen therapy based on the principle that if oxygen is introduced at a reasonable speed into a box with impermeable walls and floor but with the top open, a high concentration will be maintained in the lower part of the box, despite free diffusion upwards. A cheap and easily constructed apparatus for applying this method is described. By the use of this apparatus patients can be made to receive from 40 to 65 per cent oxygen with a flow of four to five litres per minute, and adequate control of temperature and humidity is obtained. Clinical experience with the method shows that it is efficient in adults, though not always the method of choice. In infants and children it has proved, in the hands of the writers, superior to all other methods used. The simplicity of the method and the inexpensiveness of the apparatus make it especially appropriate for the use of general practitioners and small hospitals.

Professor E. G. Oastler^s (Glasgow) discusses some physiological considerations in oxygen and carbon dioxide therapy. The importance of appreciating the insidiousness of the symptoms of anoxæmia is stressed. Some common clinical conditions associated with oxygen want are described, and the indications for oxygen and carbon dioxide therapy discussed. The lesions in lobar pneumonia and in bronchopneumonia are compared, and it is shown how the difference in the type of lesion is responsible for the different findings in the reactions of the blood in the two diseases. The question of oxygen therapy in tuberculosis is considered. The causes of anoxæmia in anæmia and circulatory

disorders, and the question of asphyxia and its treatment are also discussed. Some of the methods of administering oxygen and carbon dioxide therapeutically are described in brief, mentioning the relative advantages and disadvantages of each.

REFERENCES.—¹*Bull. Johns Hopkins Hosp.* 1933, Dec.; ²*Elliott and Nuzum, Jour. Pharmacol. and Exper. Therap.* 1931, xliii, 463; ³*Dale, Brit. Jour. Exper. Pathol.* 1920, i, 103; ⁴*Canad. Med. Assoc. Jour.* 1933, 22; ⁵*Verhandl. des deut. Kongr. f. innere Med.* 1914, xxxi, 332. *Wien. klin. Woch.* 1912, xxv, 788; ⁶*Proc. Roy. Soc. Med.* 1934, Feb., 447; ⁷*Brit. Med. Jour.* 1933, ii, 282; ⁸*New Eng. Jour. Med.* 1934, Feb. 1, 254; ⁹*Glasgow Med. Jour.* 1934, April, 139.

PHARYNGITIS, ACUTE PNEUMOCOCCAL.

F. W. Watkyn-Thomas, F.R.C.S.

R. G. Henderson¹ describes a series of 11 cases, of which 10 were fatal. All occurred in Aberdeen, and 10 of them in one year. It is noteworthy that there was, in that year, an influenza epidemic in the town, but of all the patients only one had recently had influenza, none had been in contact with cases of lobar pneumonia or bronchopneumonia, and there was no instance of case-to-case infection.

The onset is usually sudden, often with rigors; the throat is very sore and gets worse, so that dysphagia is an early sign; there is high temperature, rapid pulse, and extreme prostration. With the redness and œdema of the throat there is usually a greyish membranous exudate, most marked over the uvula and palate, but often spreading quickly and widely even on to the posterior pharyngeal wall, and occasionally to the epiglottis. This membrane is darker and drier than that of diphtheria or Vincent's angina. There is often swelling and great tenderness of the neighbouring lymphatic glands. The condition passes on to necrosis and sloughing, pneumococcal septicæmia, and death. In 3 cases tracheotomy was performed for dyspnoea caused by œdema of the glottis. In 4 cases the infecting organism was pneumococcus Type III, in 6 cases pneumococcus Type IV, in 1 case pneumococcus Type I. This last case was the only one which recovered, and was treated with the specific anti-pneumococcus Type I serum. Henderson had no success with optochin (ethyl-hydro-cupreine), or with novarsenobillon. He comments on his failure with optochin compared with the results obtained by de W. G. Richey (see MEDICAL ANNUAL, 1933, p. 349), who used it with success in four out of five Type IV cases, and believes that the condition found in his series must have been far more severe than in Richey's. [This conclusion is borne out by reference to Richey's paper.—F. W. W.-T.]

REFERENCE.—¹*Lancet*, 1934, i, 615.

PILONIDAL SINUS. (See CYSTS AND FISTULÆ.)

PITUITARY BODY.

Sir Walter Langdon-Brown, M.D., F.R.C.P.

The important part played by the pituitary in regulating the other endocrine glands is dealt with in a separate article on the integration of the endocrine system (see ENDOCRINE SYSTEM).

Basophil Adenomas.—Now that Cushing's syndrome is clearly recognized, reports of cases continue to accumulate, the condition evidently not being very rare. J. Craig and B. Cran¹ describe a typical instance in a woman of 28 where the diagnosis was correctly made during life and confirmed post-mortem. There was in addition an early colloid goitre and some hyperplasia of the adrenal cortex with recent hæmorrhage into the medulla, both of which they regarded as secondary.

R. D. Lawrence² reports an interesting case of a woman who came under

the care of the reviewer at the age of 33 for what at first appeared to be ordinary diabetes, which was readily controlled by diet and 40 units of insulin a day. Then she developed plethoric obesity with extensive discoloration of the skin and striae, hypertension, amenorrhœa, and polycythæmia. An X-ray of the pituitary fossa was normal, but the diagnosis of pituitary basophilism seemed clear. Then she fractured her pelvis by a slight fall. She entered King's College Hospital, where an X-ray of the bones showed osteoporosis and various fractures with much callus formation. The pituitary fossa was treated by six doses of X-rays and the pains in the limbs disappeared after the second dose. After an interval of three months a second series, this time of three treatments, was given. The glycosuria disappeared and she was able to take 150 grm. of carbohydrate without any insulin, her appearance greatly improved, her blood-pressure fell from 170/125 to 124/88, and her periods returned. It is very unusual for pituitary basophilism to start with glycosuria as the first symptom, and it suggests that the pancreatotrophic function of the pituitary was involved first. This is the second case which seems to have benefited by X-ray therapy to the pituitary. Lawrence admits the blunderbuss nature of such treatment, and wonders whether it may subsequently lead to hypoglycæmia, hypotension, and so on. Still, the outlook in untreated cases is bad, and the reviewer can vouch for the parlous state of the patient at the time he made the diagnosis.

The Pars Intermedia and its Functions.—Zondek and his colleagues³ claim to have prepared a new pituitary hormone from the pars intermedia to which they have given the name '*intermedin*'. It is also said to be present in the rest of the gland, in the infundibular stalk, and in the walls of the third ventricle, but nowhere else in the body. The only function they attribute to it is the known pituitary effect on the pigment-forming cells of certain cold-blooded animals. Sulzberger⁴ finds it effective in the treatment of diabetes insipidus; he asks whether intermedin may not be a specific hormone regulating water metabolism, and suggests that the beneficial effect of posterior pituitary extract in diabetes insipidus may be due to its intermedin content. Its presence in the third ventricle throws an interesting sidelight on the controversy as to the pituitary or diencephalic origin of diabetes insipidus.

REFERENCES.—¹*Quart. Jour. Med.* 1934, Jan., 57; ²*Proc. Roy. Soc. Med.* 1934, Jan., 275; ³*Klin. Woch.* 1933, 31; ⁴*Jour. Amer. Med. Assoc.* 1933, June 17, 1928.

PLAGUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

In a paper on plague in a Madras district P. V. George and W. J. Webster¹ report on the *prophylactic use of wholesale fumigation of rat burrows* in infected villages with '*cyanogas*', a proprietary preparation capable of liberating hydrogen cyanide gas when exposed to air, and said to contain about 50 per cent of calcium cyanide, and to be fatal to both rats and their fleas. Nearly twelve thousand burrows were dealt with in 2210 village houses, and it was also noticed that snakes were killed. As cases of plague ceased soon after this method was used in one large infected village, it was extended to others, until over 110,000 rat burrows had been fumigated with very promising results, for in six localities no further deaths of rats or man were noted, and in twenty more the epidemic appeared to be checked; but further tests are required, as the disease also disappeared from some untreated villages. With proper care there was no danger to human beings, and the operators did not require masks, as the nozzle of the pump is introduced for a foot and packed round with mud before pumping is begun; connecting burrows are revealed by the escape of smoke-like powder, and are at once sealed with mud. The occupants of the villages should not return for three nights.

A case of cutaneous ulcers on the chest wall due to plague is reported by C. F. de Rozario²; there were no constitutional symptoms, but bacteriological confirmation was obtained and slow recovery took place. R. D. Parulkar³ reports on eight plague cases treated with Bayer 205, with fatal results in all of them.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1934, July, 77; ²*Ind. Med. Gaz.* 1933, July, 396; ³*Ibid.* Nov., 632.

PLEURISY IN CHILDREN. (See SEROUS PLEURAL EFFUSIONS IN CHILDREN.)

PLEURODYNIA, EPIDEMIC.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—An outbreak in Yorkshire in July and August, 1933, of 7 cases, 6 of which were in children aged from 2 to 7, and 1 in a man aged 39, is reported by W. N. Pickles,¹ who states that the disease was first described by Dabney in 1888 in the United States, where its local name was 'devil's grip'. In 1923 Payne and Armstrong in the United States named it 'epidemic transient diaphragmatic spasm', and in 1924 three epidemics of a similar nature were described under the name of 'epidemic pleurisy' by various British observers.

E. Sylvest² states that he gave the name of 'Bornholm disease' to this condition in 1930 because it was described in 1903 by two practitioners of Bornholm, a Danish island in the Baltic. In 1904 it appeared in different places throughout Denmark. In 1917 it was again described by Bornholm practitioners. Subsequent epidemics occurred in Bornholm and throughout Denmark in 1930 and 1931. According to Sylvest the disease had previously been seen in Iceland since 1856 and in Norway in 1872 before it had broken out in the United States in 1888. Males and females and the inhabitants of rural and urban districts are attacked with equal frequency, but children below the age of 15 are twice as often affected as older persons. The disease commences in summer and subsides with the onset of winter.

N. L. Crone and E. M. Chapman³ state that 30 cases were admitted to the Massachusetts General Hospital, Boston, between Aug. 1 and 25, 1933. The patients, whose ages ranged from 2 to 46 years, had come from scattered regions in and around Boston. Both sexes were equally affected. The symptoms were the same as those described in other outbreaks. All recovered. A. B. Richter and H. D. Levine⁴ also record their observations on the Boston epidemic.

SYMPTOMS AND COMPLICATIONS.—According to Sylvest,² after an incubation period of from two to four days, the onset is sudden, with shivering, headache, and pain, which is most often localized in the epigastrium or below one or both costal margins. It is also frequent in the lumbar region, intercostal, pectoralis major, and scapular regions, more rarely in the trapezius and the extremities. The duration of the attack ranges from a few hours to several days, but is rarely more than a week. The temperature is raised during the attack. Examination of the chest is negative. The tenderness and pain in the affected muscles may last several weeks or months after the acute symptoms have subsided. In about a quarter of the cases one or more relapses may take place. The complications are dry pleurisy, pneumonia, pericarditis, otitis media, and orchitis. Four fatal cases were reported in Denmark in 1931, but usually the complications are mild in character.

TREATMENT.—According to Sylvest² this is purely symptomatic.

REFERENCES.—¹*Brit. Med. Jour.* 1933, ii, 817; ²*Bull. Off. internat. d'Hyg. publ.* 1932, xxiv, 1431; ³*New Eng. Jour. Med.* 1933, ccix, 1007; ⁴*Jour. Amer. Med. Assoc.* 1934, cii, 898.

J. F. Gaskell, M.A., M.D., F.R.C.P.

N. L. Crone and E. M. Chapman¹ describe an epidemic which occurred mostly in young people characterized by sudden acute pain in the chest or abdomen with rise of temperature to 102° or 103°. The onset is sudden without previous cold, malaise, or other symptoms. The pain is so severe that in 2 cases exploratory laparotomies were done for suspected appendicitis, and in 1 case for suspected perforated duodenal ulcer. In only 2 cases were any abnormal physical signs found in the chest, taking the form of a friction rub, out of the 30 cases observed by the authors. The pain and rise of temperature has usually disappeared in twenty-four hours, but may recur at twenty-four or forty-eight-hour intervals with accompanying fever up to ten days. X-ray examination of the chest was always negative. No alteration in the blood of any importance was found. The name 'pleurodynia' is unsuitable, as the pain is often abdominal. A similar epidemic was described and named 'devil's grip' by Dabney in 1888 in Virginia and again in the mid-Atlantic states in 1923. The chief importance of the recognition of the syndrome is the elimination of a more serious diagnosis. In addition to appendicitis and perforated ulcer already mentioned, angina pectoris, pericarditis, urethral and gall-bladder calculi were each considered a tenable diagnosis in as many cases.

REFERENCE.—¹*New Eng. Jour. Med.* 1933, Nov. 16, 1907.

PNEUMOGRAPHY, CEREBRAL. (See CEREBRAL PNEUMOGRAPHY.)

PNEUMONIA.

J. F. Gaskell, M.A., M.D., F.R.C.P.

Value of X Rays in Early Diagnosis.—One of the difficulties of the early diagnosis of lobar pneumonia is the absence or ambiguity of the physical signs. The widespread use of serum in treatment, especially in Type I cases, is indicating with ever greater clearness that serum must be used as early as possible, and that it becomes practically useless after the fifth day. X rays offer a means of showing consolidation before it is evident clinically, and J. B. Graesser, C. Wu, and O. H. Robertson¹ have made a study of 40 cases of lobar pneumonia by daily X-ray examinations carefully correlated with physical examination of the chest. A portable X-ray apparatus was used in the acute stage of the disease in most cases. Twenty of their cases were seen within forty-eight hours of the onset of the disease. None of those examined twenty-four hours or more after onset failed to show definite X-ray evidence of consolidation, except one case which was first seen four and a half days after the first onset of the disease, when only increased markings were seen in the lobe affected; later X rays showed definite consolidation. In all other cases X rays gave a positive diagnosis of consolidation earlier than could be definitely proved by physical examination. In the later stages of disease, when physical signs were fully developed, there was little difference between the clinical and X-ray evidence of the position and extent of the disease. With regard to resolution, there was again little difference in the value of the two methods both as regards the beginning of resolution and its completion. It appears from the authors' studies that the great value of X-ray examination is in the early days, so as to ascertain as soon as possible a definite diagnosis. In the later stages there is no object in submitting a patient who is seriously ill to the strain of an X-ray examination.

The authors give very interesting information as to the mode of development of consolidation. It first appears as a rule at the hilus of the lung and spreads outwards, involving the whole lobe in about forty-eight hours. The maximum density, however, is not reached in less than three days in the majority of cases, and in some it may take five or six days. Their values therefore

correspond closely with the anatomical evidence that it takes four to five days for grey hepatization to be brought about. Their figures, however, show that there is very considerable variation from case to case. The time needed to complete resolution is even more variable. They have also studied the question of displacement or alteration in neighbouring viscera. They find that elevation of the diaphragm on the affected side is a very early and practically constant phenomenon. Mediastinal displacement to the affected side, which has been stressed by many observers, was in their series only seen in seven cases, and in all these it was very slight. The paper is illustrated with very convincing X-ray photographs.

Peripheral Circulation in Acute Lobar Pneumonia.—Bruce Perry² has studied the peripheral circulation of the skin in lobar pneumonia, in order to find evidence that peripheral changes here are the cause of circulatory failure which is so often the fatal sequel in this disease. He relies chiefly on the skin reaction to adrenalin, alterations of pressure at the same time being brought about by a sphygmomanometer armlet, thus measuring the resistance of the contracted vessels. He finds that this resistance is definitely lowered in lobar pneumonia, and assigns it to a toxic cause. Recovery in the tone of the small vessels is slow, not being complete until long after the crisis. He finds blood-pressure raised in the height of the disease and concludes that attention should be given more to the peripheral circulation and less to the heart itself.

EPIDEMIOLOGY.—The epidemiology of pneumonia has been studied by W. G. Smillie³ from the point of view of the prevalence of the pneumococcal distribution in family contacts of cases of lobar pneumonia. He takes all persons who have been in contact with the patient at any time within the seven days before the onset of the disease. He found that Types I and II were much more prevalent in family contacts than in controls, his percentage figures being 5.4 in Type I cases against 0.2, and 11.1 in Type II cases as against 0.7. With regard to Type III, this was by far the commonest type met with and there was no difference between contacts and controls. This also held for the rarer Types IV to XIX of Cooper. He also found a seasonal prevalence of all types of pneumococci; they were much less frequent in the late summer than in the winter or spring. There is thus evidence that a local increase in the carrier rate is an important feature in the occurrence of lobar pneumonia of Types I and II.

W. D. Sutcliffe and M. Finland⁴ have published a paper dealing with the clinical significance of Cooper's Types IV to XXXII. Their investigation extended over a period of thirty-five months. The source of their material was from cases of lobar pneumonia especially, but also from cases of bronchopneumonia and other pneumococcal infections. Cases of definite lobar pneumonia have been seen due to all the types with the exception of three, the proof of this being dependent on recovery of pneumococci from the blood or effusions as well as from sputum. The authors have examined the correspondence between pneumococci from sputum and other sources, including post-mortem examination of the lung lesions, in 220 cases, and find that with a few exceptions, mainly when a double infection was present, the correspondence is very accurate.

Types V, VII, and VIII are the most common pathogenic organisms connected with lobar pneumonia; they therefore account for the greater part of the 25 to 30 per cent usually listed as Group IV. With I, II, and III they account for over 80 per cent of cases. In bronchopneumonia, on the other hand, the order of frequency is III, VIII, XVIII, XV, VII, XX, II, XI, and XIV, which together account for over 80 per cent of this group. The different types vary individually in their clinical effects, a subject worthy of further study.

TREATMENT.—Most of the literature has to do with treatment, especially by serum, but A. Behrend and R. B. G. Cowper⁵ describe a series of 11 cases with 2 deaths treated by *artificial pneumothorax*. This method was first introduced by Friedemann in 1921 and has been used sporadically by various clinicians since. Their two deaths were due to septicæmia and a late developing meningitis respectively. They consider that the method is of benefit by giving rest to the diseased lung, which the body already tries to do by rapid shallow breathing, and by relieving the acute pain, which is pleural in nature, owing to the separation of the pleural surfaces. There is also evidence that blood-flow through the disused lung is diminished and that lymphatic stasis takes place, lowering toxic absorption.

A pneumothorax was produced as early as possible, the day of disease in their series ranging from the second to the eleventh: 400–500 c.c. could usually be given with ease, and two injections sufficed in most cases, given at an interval of twenty-four hours. The most striking result was the relief of pain and dyspnœa. Temperature, pulse, and respiratory rate were always diminished, but final fall to normal took place at the usual time on the sixth to seventh day—that is to say, the severity not the course of the disease was altered. None of the feared complications—pyopneumothorax, cardiac shock, abscess, or gangrene—developed.

The value of pneumothorax in treatment has also been examined experimentally by L. M. Lieberman and S. S. Leopold.⁶ They produced experimental pneumonia in dogs by introducing pneumococci in a suspension of starch paste into the lung by catheter, according to the method used by Robertson. Thirty-six dogs were used and half were treated with pneumothorax on the second and third days of disease. In the treated group 15 recovered and 3 died; in the untreated 8 recovered and 13 died, usually on the second or third day. Those which recovered had a crisis on the fourth to fifth day. All experiments were carefully followed by X-ray examination. Though emphatically not recommending pneumothorax as a routine treatment, the authors conclude that it is a valuable method in selected cases with much pain and dyspnœa.

The *serum treatment* of lobar pneumonia is dealt with by various authors. The Therapeutic Trials Committee of the Medical Research Council⁷ give a summary of investigations conducted in London, Edinburgh, Aberdeen, and Glasgow over a period of three years. Their conclusions are in accord with the results of similar investigations in America which have already been published. Only patients between 20 and 60 years of age were included in the investigations. A total of 1375 cases were investigated: 964 were due to Types I or II, of which 348 were treated with serum supplied either by the Lederle Antitoxin Laboratories, Parke, Davis & Co., or Burroughs Wellcome & Co.; it was in almost all cases in the concentrated form. In order to correlate observations as closely as possible, a new British unit has been produced by the Standards Department which is very stable; standardized sera can be kept in the dried state almost indefinitely without deterioration. This has been evaluated against Felton's unit with serum supplied by Dr. Felton. It thus assures a standard value for all sera used in Britain correlated with the American unit. Serum has been given intravenously throughout. The routine injection was 20,000 units repeated about every eight hours up to forty-eight hours. Continuation of this, if no improvement had taken place, was found to be useless, but in some cases where improvement was slow treatment was usefully prolonged. Type II cases usually needed a larger dosage than Type I.

Harmful reactions were in general slight and took the form of dyspnœa and tachycardia immediately relieved by giving adrenalin subcutaneously. Certain

batches of serum, however, gave more alarming symptoms of a toxic nature at the first injection, but none of these were fatal. They took the form of rigors, dyspnoea, and increasing cyanosis, also collapse with a feeble pulse. Delayed serum reaction was slight and infrequent with the concentrated serum.

Alternate cases were treated as they occurred without selection. All patients in the series were admitted before the sixth day of illness, and all patients dying within twenty-four hours of admission were excluded, also those complicated by gross lesions of other organs, such as heart disease, chronic nephritis, and diabetes.

Type distribution in the aggregate approximates to that found in other countries. The percentages were Type I 35 per cent, Type II 36 per cent—this is high owing to an extensive Type II outbreak in Edinburgh—Type III 4 per cent, and Group IV 25 per cent.

The death-rate without serum was 15 per cent for Type I and 30 per cent for Type II, agreeing with the findings of other observers that Type II is the more fatal. The effect of serum treatment is especially interesting if the age periods 20 to 40 and 40 to 60 are taken separately. In the younger group serum reduced the death-rate to about half, from 11.2 per cent to 5.7 per cent in Type I cases, and from 22.7 per cent to 12.6 per cent in Type II cases. In the elder group no benefit was apparent, the rates being 26.6 per cent and 22.6 per cent for Type I, and 34.2 per cent and 35.8 per cent for Type II.

Blood cultures were systematically taken at Aberdeen and Glasgow, with the result that these centres gave little evidence of any amelioration by serum in cases with positive cultures. In the less grave cases there was general agreement that the severity of the disease was lessened in a very striking manner.

Complications were too few to give reliable data, but the total results suggest that the incidence of the commonest complication, empyema, was definitely lowered.

An independent investigation with careful selection of cases is described by Duncan Leys.⁸ All patients were between 20 and 60 and were admitted to hospital before the third day. Alternate cases were treated, all proved to have a Type I pneumonia. This rigid selection only included 30 patients out of the first 100 appearing in hospital during the time of the investigation. Doses are expressed in British dry weight units (Medical Research Council). Blood cultures were made, usually daily. All cases with a positive culture persisting after the fourth day died. Serum was given intravenously, 75 c.c. being given at one sitting slowly in fifteen to twenty minutes. This dose was 37,500 British units. Leys does not state the source of his serum, but it appears that it had considerable toxic properties, causing a reaction when about 10 c.c. had been given. The result was dramatic. In one to two hours a rigor occurred followed by profuse sweating, fall of temperature, pulse, and respiratory rate, and restful sleep, simulating an induced crisis. One case died with hyperpyrexia a few hours after injection. Leys gives a composite chart showing the characteristic fall of temperature, pulse, and respiration rate. His conclusion is that serum given early is a potent instrument for shortening the period of serious illness.

W. D. Sutcliffe and M. Finland⁹ give a very valuable report on a three-year investigation treated from three points of view: (1) The relationship of Type I cases obtained early enough for serum treatment to total pneumonia cases from all sources; (2) The clinical characteristics of Type I infection; (3) The effects of serum therapy. 1561 patients were bacteriologically examined for suspected lobar pneumonia or had pathological conditions connected with

pneumococci : 770 of these had lobar pneumonia, but only 151 adults were seen within ninety-six hours of onset. Therefore approximately one-tenth of all cases and one-fifth of cases with lobar pneumonia were suitable. If Type I cases only are considered, three-fifths were suitable. The clinical characteristics of Type I pneumonia were almost all of the typical lobar pneumonia type. Bronchopneumonia was the form in only five—two of them were over fifty, and the other three were infants; it was secondary to other conditions in four cases out of the five. It was primary in 225 out of 239 cases of typical pneumonia, and 60 per cent of these terminated by crisis. In 59 per cent definite respiratory tract infection closely preceded the pneumonia. Complications occurred in 18 per cent, taking the form of empyema in 12.6 per cent of these. Owing to various causes, only 75 of the 151 suitable patients were treated with serum; the others, therefore, acted as controls. Serum was given two-hourly in doses of 5 c.c., 25 c.c., and 45 c.c., and more at eight- to twelve-hour intervals if indicated clinically. The duration of acute disease was measured to the time when temperature dropped permanently below 101° F. with subsidence of symptoms.

This definite improvement occurred in 80 per cent of treated patients within forty-eight hours, which in the controls only occurred in 25 per cent. Improvement was even more striking when treatment could be started within the ninety-six-hour period, then occurring within an average of twelve hours. The actual duration of minor symptoms was about sixty hours, which gives a total disease period of six days six hours, the usual time for crisis. It appears from the authors' records, therefore, that serum greatly diminishes the severity and symptoms but does not produce actual crisis with a fall to subnormal temperature; the latter occurs at the usual time. Bacteræmia was also studied, and was found to disappear in 87 per cent of treated cases, and in only 41 per cent of untreated: it occurred subsequent to the first examination in only 3 per cent of treated cases against 23 per cent of untreated. The death-rate compared closely with the large aggregate results of other American observers, 18.6 per cent as against 41.3 per cent; for the group seen before ninety-six hours it was 6.1 per cent against 36.8 per cent. If serum treatment was begun within ninety-six hours, the death-rate was 12.0 per cent; when it began later, 28.2 per cent, showing the great importance of early therapy. In the group with positive blood cultures the death-rate was 26.4 per cent in the treated cases, and 71.4 per cent in the untreated, a result which compares favourably with the Medical Research Council investigation. The authors conclude that specific serum therapy can only be employed to any purpose in one out of ten cases suspected of pneumonia. It therefore cannot be of general application. In selected cases it is of the greatest value, being the only specific treatment yet proved to help.

W. P. Belk and J. S. Sharpe,¹⁰ on the other hand, plead for a reconsideration of the value of *Huntton's pneumococcus antibody*. They have treated 130 cases in this way and compare them with 52 untreated cases, over the period 1929–31. Treatment consisted in the injection of 50 c.c. intravenously three or four times a day, giving an average of 460 c.c. in all. They claim a special value for this method in cases with positive blood culture and in Types III and Group IV where at present serum is of no value. As regards Types I and II, the benefit is hardly apparent in the figures they give.

R. Hilton¹¹ discusses the value of *carbon dioxide therapy*. He deals with the matter theoretically and shows that the CO₂ saturation of the blood is lowered in lobar pneumonia. The ill effects of this, which are due to so many factors as to be at present beyond analysis, can be removed very rapidly by giving CO₂. In his cases increase of tidal air by 100 c.mm. by CO₂ therapy

was not sufficient to cause increased symptoms such as pleural pain, and raised the arterial CO_2 by ten volumes per cent. He concludes that in the absence of respiratory failure the chemical effects of CO_2 administration in air are not sufficient to warrant its use in lobar pneumonia.

REFERENCES.—¹*Arch. of Internal Med.* 1934, Feb., 249; ²*Quart. Jour. Med.* 1934, April, 273; ³*Jour. Amer. Med. Assoc.* 1933, ci, Oct. 21, 1281; ⁴*Ibid.* 1289; ⁵*Ibid.* 1934, cii, June 9, 1907; ⁶*Amer. Jour. Med. Sci.* 1934, March, 315; ⁷*Brit. Med. Jour.* 1934, Feb. 10, 241; *Lancet*, 1934, Feb. 10, 290; ⁸*Lancet*, 1933, Sept. 30, 748; ⁹*New Eng. Jour. Med.* 1934, cex, Feb. 1, 237; ¹⁰*Amer. Jour. Med. Sci.* 1934, clxxxvii, June, 844; ¹¹*Brit. Med. Jour.* 1934, March 10, 418.

PNEUMONOCONIOSIS. (See also X-RAY DIAGNOSIS.)

J. F. Gaskell, M.A., M.D., F.R.C.P.

The growing importance of silicosis and its allied dust diseases and the unsatisfactory position from the medico-legal point of view are emphasized by M. Kummel.¹ He states that 15 per cent of all industrial workers are exposed to dust hazards, so that silicosis is destined to become the most important of occupational diseases. The medico-legal position should therefore be much more carefully defined and cases should be removed from ordinary Law Courts to Workmen's Compensation Courts. One of the difficulties of the position is that the onset is insidious and slow, and very definite silicosis can be present without causing marked disability. A discussion in the Section on Preventive and Industrial Medicine at the 84th meeting of the American Medical Association defines the views at present held in America, and very closely agrees with Irvine's report of 1930 on the same problem in South Africa.

R. R. Sayers² reports the results of an investigation of over 7000 miners in the Picher district of Oklahoma. He divides the disease into two classes, silicosis with tuberculosis, and silicosis pure; the study mainly concerns the latter, which has been divided into three stages, called in South Africa and Ontario the anteprimary, primary, and secondary. In the first stage symptoms are few and indefinite. The ability to expand the chest may be a little diminished and there may be slight shortness of breath with a tendency to recurrent colds. X-ray examination gives the earliest specific indications in a generalized increase in the bronchial and peri-bronchial 'arborization' shadows throughout the lung fields with or without small discrete mottling in addition. To this may be added an alteration in inspiratory murmur, which becomes harsher and higher-pitched. The man is usually robust and apparently enjoys good health. In the second stage shortness of breath becomes marked on exertion and may be accompanied by pains in the chest. There is dry cough which may be accompanied by vomiting, and recurrent colds are frequent. Chest expansion is noticeably diminished. The man may otherwise still appear healthy and not lose weight. X rays show medium-sized mottling of discrete nodules on a background of fibrous arborization. In the third stage shortness of breath is marked and distressing, and capacity for work is seriously impaired. Cough is more frequent, and expectoration, usually slight, may become copious. X-ray mottling is still more intense, the nodules being large and often coalescing. The general nutrition of the patient may still remain good. Only 36 examples of the third stage were found in the 7722 men in the Picher series. The super-vention of tuberculosis was clearly indicated by a definite drop in weight, with dyspnoea out of proportion to the stage of silicosis: 267 cases of lung tuberculosis were found in the series.

Lanza deals in the same series with the etiology, pointing out that the harmful silica particles are only from 10μ to 5μ in diameter, so finely divided as to be invisible to the naked eye, and that the total exposure as well as the dust concentration are most important in the rapidity with which the condition

is acquired. At Picher the younger men in the first stage had had an average exposure of 13 years, but older men over forty developed the condition more rapidly, their exposure averaging just under 8 years. Previous lung disease also disposed to more rapid development of silicosis.

McNally deals with the chemical side and especially the silica content that should be regarded as abnormal. All lungs and many other tissues contain an amount of silica increasing with age which must be considered as normal. He investigated the silica content in 30 cases where death occurred from various diseases unassociated with massive dust exposure and found an average value of 1.13 mgrm. per gm. of dried lung. Any value over 2 mgrm. is to be looked upon as abnormal.

Pancoast and Prendergast investigate the X-ray diagnosis of the condition in greater detail, emphasizing that on this the diagnosis of the various stages and therefore the medico-legal aspect of the disease largely depends. They group the X-ray appearances with the pathological conditions present, and describe three 'phases': (1) Peribronchial and perivascular phase, with increased hilar and trunk shadows. (2) Early interstitial phase, with a homogeneous haze appearing first in the right lower field and gradually spreading. Small discrete nodules may or may not coexist. Diaphragmatic movement is now impaired. (3) Nodular phase, characteristic, but may not occur if the disease is unusually rapid. Diaphragm excursion is now very limited, often with peaking of the domes. The writers point out the difficulties of differential diagnosis, especially in the first phase, and emphasize the importance of a series of examinations.

A. J. Amor and R. G. Prosser Evans³ give particulars of silicosis in South Wales coal-miners. They stress the importance of X-ray diagnosis and emphasize the frequent occurrence of basal emphysema.

P. A. Quaintance and F. J. Morris⁴ report an investigation at Los Angeles of pottery workers in bathroom ware. The clay used contains 20 per cent silica, and the danger is mainly in the casting-room, where free silica dust is used. Out of the 106 workers, 58 had silicosis: 8.6 per cent of these were in the third stage, 38.0 per cent in the second stage, and 53.4 per cent in the first. The average exposure was 16 years for the advanced cases. Tuberculosis was not found in the investigation.

The question whether the silica content of anthracite dust is the chief or perhaps only factor in pneumoconiosis is further elucidated by the report of the Industrial Pulmonary Disease Committee of the Medical Research Council⁵ on the effect of anthracite dust. The area selected was the South Wales anthracite area. After rejecting the coal-face workers and screen workers as giving false values, the committee finally selected a group of coal-trimmers in Swansea where the anthracite is loaded into ships. Of the 250 men employed, a group of 40 were selected for a searching clinical and radiological investigation. They conclude that anthracite dust does not give rise to fibrosis of the lung.

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PNEUMOTHORAX, SPONTANEOUS.

J. F. Gaskell, M.A., M.D., F.R.C.P.

Comprehensive reviews of the literature of this condition are given by F. Tronchetti¹ and H. Krasso². The former also gives illustrative cases of his own, and states that there are two main groups which have been distinguished for thirty years: (1) Those occurring in pulmonary tuberculosis and of very serious import; (2) Cases in young people with good health, which are of little

danger. The great mass of recorded cases belong to the first group, 80 to 90 per cent in adults and 40 to 50 per cent in children, according to various authors. Besides these main groups other causes of spontaneous pneumothorax exist, such as pneumonia and bronchopneumonia, with their sequelae of lung abscess and gangrene; also infarcts, asthma, and emphysema. Fouquier has also described a case of pneumothorax following rupture of a hydatid cyst into the pleural cavity, and syphilis of the lung and silicosis may cause it. Two cases have been described in typhus fever. Air or gas can also get into the pleural cavity from viscera other than the lung in carcinoma of the œsophagus and perforation of a gastric ulcer adherent to the diaphragm. Trauma of various kinds can cause it, especially rupture of the ribs with consequent tearing of the visceral pleura; it has also occurred while performing a puncture for artificial pneumothorax.

The cases occurring in young healthy persons are especially interesting, and records of these have rapidly increased in number since Proust and Argy first collected cases in 1887. Radiology has also helped not only definitely to prove the presence and extent of the condition, when already recognized, but also to prove the existence of pneumothorax in doubtful or unsuspected cases. The clinical characteristics of this idiopathic spontaneous pneumothorax are: (1) Sudden onset in a young person apparently well with no sign of tuberculosis or other lung disease; (2) A benign afebrile course without the formation of pleural exudate; (3) The lesion has a special tendency to spontaneous cure.

The etiology is the intriguing question, for owing to the benign nature of the disease only six cases have been described with anatomical findings. There are three views concerning the cause of the condition—namely, that it is due to: (1) Latent or healed tuberculosis; (2) Rupture of an emphysematous bulla; (3) 'Strain'—for many occur while physical effort is being made. It is probable that rupture can only occur at points of lowered resistance in the visceral pleura. The present evidence appears to show that the rupture of a solitary vesicle, which is often apical, is the cause of idiopathic pneumothorax. Hayashi and others hold that this is due to the formation of a valve-like stricture in a bronchiole which allows entry of air but not exit. The bulla consequently grows and its wall stretches, till rupture finally takes place. Cases have also been held to be due to a local survival of an embryonic patch of visceral pleura. Is this stricture of a bronchiole due to tuberculous fibrosis from very slight tuberculosis? Kjaergaard followed up 49 patients who had had idiopathic spontaneous pneumothorax over a period of years, and only one later developed tuberculosis. Progressive tuberculosis can therefore be excluded, but this does not exclude a possible origin in a healed tuberculous focus. One of Tronchetti's cases was typical clinically of the idiopathic type, but was in a known tuberculous subject, who had apparently been completely cured. The other two of his cases of this type were so similar that he thinks tuberculosis the probable cause of them. He concludes that the division into the two groups, tuberculous and non-tuberculous, is useful from the prognostic and evolutionary point of view, but of doubtful value etiologically. Both are probably due to tuberculosis, progressive or healed.

Krasso's review is more concerned with the commoner type due to and following a primary illness, and he gives details of the physical signs as well as a review of the causes that bring about the condition. He holds that the idiopathic type is tuberculous in origin. Prognosis depends entirely on the cause of the condition. Treatment is that of the basic condition.

C. H. Vrooman³ deals only with idiopathic spontaneous pneumothorax and describes seven cases of this condition, only one of which had any previous history suggestive of tuberculosis. In the cases where the pneumothorax was

localized and not complete, only an X-ray showed the true condition. He holds that the cause is some exertion which causes a pleuritic adhesion suddenly to tear the lung tissue. Such cases should not be considered without further evidence as clinically tuberculous, but rather as tuberculous suspects.

C. A. Birch¹ describes an apparatus to determine by gas analysis the gases present in a pneumothorax, with illustrative cases showing that a high oxygen percentage and low CO₂ content indicate a pleuro-bronchial fistula, and low oxygen and high CO₂ a closed air cavity. The differences are so great as to be unmistakable, and the method is of value in that it proves the presence or absence of a direct communication with the bronchi.

REFERENCES.—¹*Polliclinico*, 1934, xli, May 7, 683, and May 14, 728; ²*Wien. klin. Woch.* 1933, Sept. 1, 1065; ³*Canad. Med. Assoc. Jour.* 1934, March, 265; ⁴*Lancet*, 1934, May 12, 1002.

POISONING. (See also CORNEA, DISEASES OF—ARSENICAL POISONING; 'HYPNOTICS; PHARMACOLOGY AND THERAPEUTICS—CHARCOAL.)

G. E. Oates, M.D., M.R.C.P., D.P.H.

The Barbituric Acid Group.—A useful summary of the uses and dangers of the hypnotic drugs of the barbituric acid group is furnished by W. H. Willcox.¹ Barbitone or veronal is diethyl barbituric acid and is the simplest member. A considerable number of higher derivatives are on the market. The addition of alkyl or aryl radicals of higher molecular weight than ethyl adds to the toxicity of the substance. Thus, taking veronal as unity, the relative toxicity for dial is 3.1, soneryl 4.7, and nembutal 10.1. The combination of a barbituric acid compound with an analgesic drug (such as amidopyrine, phenacetin, etc., in veramon, allonal, cibalgin, and quadranox) is not unusual, but appears to the author to be dangerous, since the barbituric acid compound is much more toxic than the analgesic drug, and this may lead to an overdosage of the barbiturate when the preparation is taken in large doses to relieve pain. The barbiturates are quickly absorbed when taken by the mouth, and within an hour or so of taking a clinical dose sleep usually ensues, lasting from six to twelve hours, and without unpleasant after-effects. There is more certainty of action than with most of the other hypnotics and hence the popularity of this group. Certain members, such as nembutal and evipan, are used for basal anaesthesia.

Like other poisons, if taken on an empty stomach and in solution, the effect is more rapid and intense. The taking of alcohol with the drug seems to increase the toxic effect. Some persons have a natural increased susceptibility to these drugs and indeed to drugs of all kinds. We find in such cases a highly-strung nervous temperament and a history of abnormally excessive reaction to medicinal preparations. The susceptibility of a patient to this group of drugs is greatly enhanced by the prolonged toxic effects of some existing disease and by such conditions as allergy, defective renal function, hyperthyroidism, myocardial disease, glycosuria, and defective liver function.

Idiosyncrasy may lead to symptoms of acute or subacute poisoning from a normal full dose—for example, the author has seen prolonged coma, suppression of urine, and bronchopneumonia follow a normal dose by mouth of 3 gr. of nembutal. He also mentions a number of symptoms, such as mental depression, drowsiness, vertigo, ataxic gait, facial paralysis, and tremors, which may follow the repeated use of therapeutic doses. In fact, the symptoms may closely resemble those of organic nervous diseases such as encephalitis lethargica, bulbar paralysis, etc. It is recalled that actual degenerative changes in the nerve-cells of animals have been shown to follow the prolonged administration of barbituric acid compounds.

In healthy persons these compounds are fairly rapidly excreted, and accumulation does not readily occur, but the author has seen toxic jaundice follow the daily taking of 1 gr. of luminal for over a year. Only a slight degree of tolerance is established even after long use. It is for this reason that a moderate overdose is usually followed by severe symptoms. The author has seen a large number of cases where a definite craving for the drug has arisen after repeated daily administration, and the daily use of the drug has been continued in spite of strong medical advice to the contrary. Addiction to this group of drugs differs from morphine and heroin addiction in that sudden discontinuance is not followed by severe withdrawal symptoms. In prescribing hypnotics the author advises a selection of the less toxic type of drug whose action is well known, and he states he has been so impressed by their toxic effects that he never prescribes any of the barbituric acid group of drugs.

In France there is intensive interest in barbiturate poisoning, the prevalence of which has suddenly increased since 1930. There are now said to be thousands of cases every year in Paris. The augmentation in the number of severe cases is due to the fact that this group of drugs is becoming the method of choice for suicide amongst certain classes, and has completely ousted laudanum. C. Flandin, F. Joly, and J. Bernard,² whose opinion is quoted above, support the use of large doses of *strychnine* in treatment of this kind of poisoning. They recommend doses of from $\frac{1}{4}$ to $\frac{1}{2}$ gr., repeated hourly if necessary. This method requires the constant and watchful care of a medical man, who must be fully conversant with the initial signs of strychnine poisoning. The authors conclude that although this method of treatment does not provide miraculous cures, yet it does save a number of patients who would otherwise die. They conclude that strychnine, even in the large doses mentioned, has a disappointingly feeble action as a respiratory stimulant, and recommend for this purpose coramine or inhalation of carbogen.

J. Purves-Stewart and W. Willcox³ describe the routine treatment of acute veronal poisoning as practised by them. This includes prompt gastric lavage with warm water, 20 fluid ounces of hot coffee mixed with two tablespoonfuls of glucose being afterwards introduced into the stomach. This lavage is repeated together with colonic lavage and rectal administration of glucose solution. Strychnine and atropine are given in full doses. Mention is also made of picrotoxin and oxygen inhalations by nasal tube. They consider that the most urgent indication is to hasten the removal of the drug from the central nervous system and especially from the vital medullary centres, which are continually bathed by the poison in high concentration. Accordingly they withdraw cerebrospinal fluid by lumbar or, better still, by cisternal puncture. If meanwhile no fresh veronal is being absorbed into the circulation, the new cerebrospinal fluid, secreted by the choroid plexuses within the cerebral ventricles, will contain progressively diminishing quantities of the drug and the prospects of recovery will be materially improved. The authors corroborate the observations of R. Richards,⁴ that a patient, having already become confused by an initial dose of a barbituric acid compound, may continue on the same occasion automatically to take further and possibly fatal quantities of the drug without realizing the danger.

An inquest at Paddington held on a woman who was found to have died from narcotic drugs, due to misadventure, revealed⁵ an acute difference of opinion amongst experts as to the utility of this group of narcotics. The patient had been under treatment in a nursing home and suffered from insomnia. She received nembutal and medinal. E. Mapother testified that nembutal was extensively used at Maudsley Hospital. Over 6000 doses had been given to patients under his supervision. The maximum quantity given to a patient

in twenty-four hours was $13\frac{1}{2}$ gr., in three doses of $4\frac{1}{2}$ gr. each. A maximum of 6-gr. doses had been given on some occasions. The drug was used to produce sleep in quiet patients and a sedative effect in restless ones. No unfortunate consequences had resulted. The effect of nembutal was transient and it was excreted in five or six hours. A. H. Douthwaite testified that the drugs in question had no continuing effect. There could have been no danger from the $7\frac{1}{2}$ gr. of medinal which was given to the patient on the day of her death. W. Willcox expressed the views cited above. He believed that death in this case was due to the combination of narcotic drugs, with certain other contributory factors.

Dinitrophenol.—The death last year of a young professional dancer from an overdose of a nitrophenol preparation, which was investigated at the Paddington coroner's court, has called attention to the danger which may result from the indiscriminate use of 'slimming' preparations by the general public. During the last three years drugs of the nitrophenol group have been widely used in the treatment of obesity, and at least two deaths, apart from the one noted above, have been recorded. Apart from this there is ample evidence that more or less serious toxic symptoms are not uncommon. The most commonly used drug of this kind is 2:4—dinitrophenol, and D. M. Dunlop⁶ has furnished a useful account of its action as a metabolic stimulant. All workers on this subject are agreed that the action of the drug in stimulating the metabolic rate is peripheral, due to an increased oxygen consumption in the tissues, and is independent of nervous or glandular action. In considering the source of the fuel for the increased metabolism they are also agreed that the body proteins are not broken down to any appreciable extent. W. C. Cutting and M. L. Tainter, whose papers are fully cited by Dunlop, have performed numerous experimental and clinical studies on the drug, which have failed to reveal any real difference between the excess metabolism due to it and that occurring normally. These workers, using the drug in doses of 3 to 5 mgrm. per kilo. of body weight, have recommended its use in the treatment of obesity, and have recently published encouraging results from extended clinical trials in which an average daily oral dose of 0.3 gm. (5 gr.) of the drug was administered to 113 consecutive cases of obesity without drastic dietetic restrictions. No severe cumulative or toxic effects were produced, though most of the patients noticed a sense of increased warmth and increased sweating, while in 7 per cent of them a skin rash occurred, and in 5.3 per cent there was a loss of taste. These side-actions cleared up quickly without any sequelæ on discontinuing the medication. Dunlop, by direct observation on obese patients under treatment, found that the absorption of the drug was exceedingly rapid, a noticeable effect being produced on the metabolism a quarter of an hour after the oral administration of a single dose, and the maximum effect for the day being produced in an hour's time. This effect would last almost unimpaired for twenty-four hours, but in forty-eight hours the metabolism had invariably fallen to a level only slightly above its original value.

With the daily administration of the drug the metabolism rose rapidly on the first day, and on subsequent days continued to rise slightly. A maximum level was reached about the fourth day, at which point it remained, fluctuating within very narrow limits, till an increased dose sent it up still further, or the withdrawal of the drug brought it rapidly to normal. For all practical purposes the effect on the metabolism, even after prolonged administration, had worn off within seventy-two hours of the withdrawal of the drug. The rapidity with which the action of the drug on the metabolism wears off, and the rapidity with which its effects become manifest, are thus in marked contrast to the slow onset and slow subsidence of thyroid action, the effects of which only become

apparent after some three or four days after its administration is started, and continue for five to six days after it has been withdrawn.

No important increase in pulse-rate or change in blood-pressure was produced by dinitrophenol, a 40 to 50 per cent increase in metabolism being associated with a pulse-rate raised by less than ten beats per minute. These observations are in remarkable contrast with the effects of thyroid extract on the circulation, which contra-indicates its use in cases of obesity. For instance, a metabolic increase of only 20 per cent induced by thyroid extract resulted in the pulse-rate being accelerated by twenty-four beats per minute, and caused the patient to complain of palpitation. Whilst this constitutes a distinct advantage of dinitrophenol over thyroid extract or thyroxine, it is in one respect a drawback, since no conception of the extent of the metabolic increase can be gauged from the state of the pulse; and the only methods of evaluating the metabolism under dinitrophenol are by resort to the somewhat cumbrous procedure of determining the basal metabolic rate, or by relying on the subjective sensations of the patient, which may convey an erroneous impression. In obese patients Dunlop considers that the weight loss produced by dinitrophenol is exceedingly disappointing, and he finds the great increase in metabolism which it occasions is associated with a loss of weight quite insignificant in comparison with that produced by thyroid, in spite of the fact that the metabolism was not raised to anything like the same extent by the latter. He considers that this disparity in results can only be explained by the fact that thyroid exercises a marked effect on the partition of water in the body, whereas dinitrophenol is ineffective in this respect, in spite of the considerable sweating which it induces.

As regards the subjective sensations of the patient, these are not unpleasant as long as the metabolic increase is not more than 30 per cent above the patient's normal. In fact, with small increases of metabolism a rather pleasurable feeling of comfortable warmth is produced. With a greater elevation, however, uncomfortable symptoms of heat and sweating are experienced, and with a rise of over 40 per cent the patients are considerably distressed by these effects, and complain of lethargy and exhaustion. In spite of this there is no significant elevation of the temperature at any time. Lastly, the author points out that neither dinitrophenol nor thyroid extract can compare with dietetic restriction as a weight reducer.

E. C. Dodds, working with W. J. Pope,⁷ and with J. D. Robertson,⁸ has investigated the action of dinitro-ortho-cresol as a stimulator of metabolism, particularly with a view to finding the daily dose necessary to maintain the basal metabolic rate at a constant level between +30 and +50, without untoward symptoms. This was found to be from 0.5 to 1 mgrm. per kilo. body weight. Toxic symptoms apparently occurred only when the basal metabolic rate exceeded +50. These included sweating, lethargy with a desire to sleep during the day, and the impossibility of sleep during the night owing to sweating. This was accompanied by severe headache and loss of appetite, and in addition a definite pigmentation appeared on the conjunctivæ. This resembled the early stages of jaundice, but careful examination of the blood and urine failed to reveal the presence of bile-pigments. From clinical observations it would appear that dinitro-ortho-cresol is in the region of five times as potent as dinitrophenol, and no more dangerous if the administration is carefully controlled.

(See also OBESITY.)

Poisoning by Caustic Soda.—Poisoning by the fixed caustic alkalis is comparatively rare in England, although on the Continent fatal cases appear to be not uncommon. In England ammonia is the alkali more frequently

used as a poison. S. G. Willimott and M. Gosden⁹ describe eight cases of poisoning by caustic soda which occurred in Cyprus during one year, and, contrary to the experience in this country, half of them were suicidal. The use of caustic soda for domestic washing purposes has greatly increased during the last few years, owing to its cheapness, availability, and superiority to washing soda (Na_2CO_3). As a result of recent experience the authorities in Cyprus have placed caustic soda and caustic potash on the Poisons Schedule, and have virtually restricted its use to commercial laundries. The Hungarian Government took a similar step for similar reasons in 1926. Alkali corrosions of mucous membranes are usually œdematous and unctuous as compared with those from acids, which are dry and hard. The alkali extracts water from the tissues and attacks the protein, forming alkali-albuminate, which becomes gelatinous, swells, and in the presence of much water commences to dissolve—a process termed 'colliquation'. Because of this, alkali burns penetrate deeply into the tissues, although cases of perforation are few compared with those which develop stricture later on. Treatment should follow the accepted lines of avoidance of stomach lavage, and the administration of organic acids and liquids in order to reduce the concentration of the alkali. The use of the bougie at the proper time is important, in order to avoid the later complications of œsophageal stricture. The authors describe areas of necrosis in the liver and kidney, not apparently previously described in this condition. The fatal dose of caustic soda is less than 10 grm., and a quantity of 5 grm., in solution, has produced the most serious consequences of stricture. The prognosis in alkali poisoning is doubtful, and even in what appear to be mild cases long-continued observation and treatment are essential.

Carbon Bisulphide Poisoning.—Poisoning by carbon bisulphide contracted in a factory or workshop is compulsorily notifiable to the Chief Inspector of Factories by medical practitioners. A Home Office Memorandum¹⁰ has been issued on this subject. Carbon bisulphide (CS_2), a colourless liquid, is used in various industries, such as the manufacture of artificial silk and of dipped rubber goods and in the vulcanizing of rubber. It readily vaporizes, and its use is attended with serious risk of fire or explosion. The vapour is toxic, even in low concentrations, and has a profound effect on the nervous system. The usual effects in workers exposed to the vapour are chronic in character and are produced by the inhalation of small quantities of the vapour over some weeks or months. Among the first symptoms of ill health are nausea, indigestion, headache, and giddiness, sometimes accompanied by emotional disturbances which may be frankly hysterical in character. The breath has a peculiar odour, the tongue is pale and flabby, and there is facial pallor.

In cases of mild absorption of the vapour, an appearance of anxiety with sweating of the hands and forehead is suggestive. Such symptoms indicate a degree of exposure which, if continued, may lead to effects chronic in character unless the worker is removed from the toxic atmosphere. With continued exposure the mental disturbance increases and is accompanied by impairment of memory, mental dullness, and depression. The speech may be affected, and a contraction of the visual fields with diminution of the power of accommodation occurs later. One of the earliest signs of chronic intoxication is muscular weakness due to a toxic neuritis. Weakness of the facial muscles or of the flexor muscles of the forearms is met with early, the muscles of the lower limbs being affected later. Tremor, paræsthesia, and loss of sensation are also seen, and, as a later complication, optic neuritis. As the effects become more profound, there is great difficulty in walking, and ultimately the affected person may become paralysed, bedridden, and unable even to feed himself.

Recovery, in the less advanced cases, although slow, usually takes place after removal from the toxic vapour, but in advanced cases permanent effects may remain. In acute poisoning following exposure to high concentration over short periods, the symptoms are those associated with acute mental disturbance, and in some cases acute mania.

The most important preventive measures are : (1) The provision of efficient exhaust ventilation for the removal of the vapour ; and (2) Regular change of employment to another process where there is no exposure to carbon bisulphide. Medical examination of exposed workers, at intervals of not more than one month, is essential if the earliest signs of absorption are to be detected.

Bromide Poisoning.—The picture of bromide intoxication, particularly that of the delirium state, is often modified by the underlying psychiatric make-up of the individual. He is likely to be of the type which takes refuge in drugs and alcohol, and many cases are seen in the inmates of mental hospitals. E. B. Craven, jun.,¹¹ describes a series of cases arising in normal persons who had become overdosed during acute illness or convalescence or who had taken the drug in the form of proprietary medicines during times of unusual mental or physical distress. Usually the patient will have taken bromides during a period of days or weeks. He becomes restless and irritable, and complains of headache, blurring of vision, interrupted sleep, and disordered and frightening dreams. As these symptoms endure there are observed weakness, ataxia, slurring and hesitancy of speech, irrelevant conversation, poor appetite, and loss of memory, particularly for recent events. Drowsiness and lethargy are soon followed by stupor, and sleep is even more disturbed by disordered dreams. Hallucinations, both visual and auditory, become a prominent feature, and maniacal attacks of excitement are provoked by the fear reaction produced. There may be delusions of persecution, but these seem to be secondary to the hallucinatory experiences of the patient. The patient does not appear acutely ill and the temperature and respiratory rate are not elevated.

The author found the usual sedatives to be useless in treatment and they rather tended to excite maniacal outbursts. Large doses of sodium chloride were given every two hours by mouth together with excess of water. The author was unable to confirm the experience of C. P. Wagner and D. E. Bunbury,¹² who found that soon after the administration of sodium chloride there was a rise in the blood-bromide, concomitant with an increase in the severity of the symptoms. He did not make observations of the blood-bromide until three days or so after the beginning of treatment, and in all cases found the blood bromide to be lower than before treatment. He did not observe any exacerbation of symptoms after beginning treatment. Usually during the first five days of the above form of treatment little clinical improvement was detected, but between the sixth and ninth days there was often an abrupt change, the patient becoming completely lucid and oriented during the day but with disordered dreams at night for several days more. The author considers that the signs and symptoms of bromide intoxication recur with sufficient regularity to constitute a clinical syndrome.

REFERENCES.—¹*Brit. Med. Jour.* 1934, March 10, 415 ; ²*Ibid.* Aug. 11, 263 ; ³*Lancet*, 1934, March 10, 500 ; ⁴*Brit. Med. Jour.* 1934, i, 331 ; ⁵*Ibid.* 1933, i, 492 ; ⁶*Ibid.* 1934, i, 524 ; ⁷*Lancet*, 1933, ii, 352 ; ⁸*Ibid.* 1137 and 1197 ; ⁹*Brit. Med. Jour.* 1934, ii, 1022 ; ¹⁰*H.M. Stationery Office*, 1934 ; ¹¹*Amer. Jour. Med. Sci.* 1933, Oct., 525 ; ¹²*Jour. Amer. Med. Assoc.* 1930, xev, 1725.

POLYCYTHÆMIA VERA. (See BLOOD DISEASES.)

POLYNEURITIS, GESTATIONAL. *Macdonald Critchley, M.D., F.R.C.P.*

In the MEDICAL ANNUAL for 1933 (p. 392) a short account was given of records of peripheral neuritis associated with pregnancy or the puerperium. Illustrative case-reports continue to appear, and an interesting survey of this disorder has lately been made by E. D. Plass and W. F. Mengert,¹ who have studied 12 cases of their own.

According to these authors, gestational polyneuritis has recently been described by N. J. Berkwitz and N. H. Lufkin,² K. M. Wilson and P. Garvey,³ L. S. McGoogan,⁴ L. O. Hoffman,⁵ and M. B. Strauss and W. J. McDonald.⁶ Two hypotheses are commonly held to account for the neuritis. One view assumes the presence of a toxin produced by the products of conception. More recently, however, there has been a tendency to stress the resemblances with beri-beri and pellagra and to assume a deficiency of the vitamin B complex. The morbid anatomy of gestational polyneuritis comprises degenerative changes in the peripheral nerves, and also at times in the anterior-horn cells of the spinal cord. Mild degenerative changes may also occur in the viscera.

It is impossible to assess the frequency of this disorder, but it is suggested that it is less rare than commonly thought. The disease is commonest in first or second pregnancies. In an interesting record by C. C. Ungley⁷ attacks of polyneuritis of irregular distribution affected a mother and two daughters at different times over a period of twenty years, and showed a marked tendency to appear or recur during pregnancy and parturition.

Gestational polyneuritis develops late in the course of, or following, an attack of hyperemesis gravidarum, appearing twelve to twenty weeks after conception. Frequently the earliest symptoms are regarded as neurotic in character. Muscular weakness first appears in the lower extremities and may be confined to them. Extensors are usually more affected than the flexors. Sometimes the paralysis is of the ascending type. The affected muscles become soft, flabby, and atrophic. Hypersensitivity of the skin may be present, but more often there is deep tenderness of the muscles and nerve-trunks. Passive stretching of the peripheral nerves produces considerable pain. Tachycardia is both a constant and an early sign. The heart-rate is not affected by injections of atropine. Electrocardiograms reveal no disorder of the heart's action other than the increase in rate. The tendon reflexes disappear, the change showing itself first in the ankle and then in the knee-jerks. The plantar responses may be unobtainable. Psychological symptoms typical of a Korsakoff's psychosis may appear later, and in occasional cases may be permanent. Among the outstanding mental symptoms are disorientation, confusion, defect of memory, confabulation, drowsiness, and delirium.

In addition to the foregoing characteristic features, a number of other signs and symptoms may occasionally be present. These include nystagmus, squint, diplopia, retrobulbar optic neuritis, and even mild papilloedema. Difficulty in swallowing and in respiration may occur. Impaired control of the sphincters may develop late.

No constant biochemical abnormalities occur. Occasionally there is evidence of a moderate degree of nitrogen retention. There may also be an achlorhydria.

Out of 48 cases collected from the literature by Berkwitz and Lufkin, there were 9 deaths, giving a mortality of 18 per cent. Recovery, when it occurs, is slow but usually complete.

In respect of prevention the authors emphasize the importance of maintaining a full complement of vitamins, especially when a high carbohydrate diet is prescribed on account of hyperemesis. Vitamin B may be given as a curative measure, and the three cases so treated by Strauss and McDonald all recovered. The uterus should probably be emptied as soon as gestational

polyneuritis is diagnosed, but the disease is not necessarily improved thereby. On account of the liability to recurrence with subsequent pregnancies sterilization or contraception should be advocated. Symptomatic treatment of the neuritis will include massage and heat to the limbs and salicylates by mouth.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, Dec. 23, 2020; ²*Surg. Gynecol. and Obst.* 1932, liv, 743; ³*Amer. Jour. Obst. and Gynecol.* 1932, xxiii, 775; ⁴*Journal-Lancet*, 1932, lii, 735; ⁵*Nebraska State Med. Jour.* 1932, xvii, 422; ⁶*Jour. Neurol. and Psychopathol.* 1933, July, 15; ⁷*Ibid.* 1933, July, xiv, 15.

POLYNEURITIS, TOXIC, HEART IN. (See HEART IN TOXIC POLYNEURITIS.)

POSTERIOR INTEROSSEOUS NERVE, AFFECTIONS OF.

Macdonald Critchley, M.D., F.R.C.P.

Isolated paralyses of this nerve are not common; from the literature it appears that trauma accounts for the majority of such cases, a punctured wound being usually responsible.

H. W. Woltman and J. R. Learmonth¹ have recently drawn attention to a series of cases in which there was a progressive affection of the posterior interosseous nerve. The clinical features consist in a gradually appearing weakness of the hand. A difficulty of extending the little finger is usually the first symptom, followed by a similar weakness of extension in the other fingers and in the wrist. There is no complaint of pain or dysæsthesia. Examination reveals wasting of the muscles on the dorsal aspect of the forearm, with electrical reactions of degeneration. No objective sensory changes are to be found, but sometimes—as in the case previously recorded by Guillain and Courtellement²—points of deep tenderness occur in the forearm over the supinator brevis.

Cases of bilateral posterior interosseous neuritis are usually the result of chronic lead intoxication.

Under the term '*cheiralgia paræsthetica*' R. Wartenberg³ has described a sensory affection attributed to a neuritis of a cutaneous branch of the radial nerve. Pains or tingling occur along the radial side of the hand, thumb, and index finger; on examination impairment of sensibility is found over this area, and also pain on traction or percussion of the affected nerve. The etiological factors in Wartenberg's cases are of interest. Over-exertion was probably responsible in three; in one a punctured wound had injured the nerve; and in another there was a history of exposure to cold. In another case pressure from the band of a wrist-watch may have been operative, as in the cases previously recorded by J. B. Stopford.⁴

REFERENCES.—¹*Brain*, 1934, lvii, 25; ²*Presse méd.* 1905, i, 50; ³*Zeits. f. d. g. Neurol. u. Psychiat.* 1932, cxli, 145; ⁴*Lancet*, 1922, i, 993.

POST-PARTUM HÆMORRHAGE. (See LABOUR AND ITS COMPLICATIONS.)

PREGNANCY AND ITS DISORDERS. (See also DIABETES MELLITUS; HEART DISEASE; POLYNEURITIS, GESTATIONAL.)

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

Pre-eclamptic Toxæmia.—In order to obtain accurate information regarding the early signs of pre-eclamptic toxæmia with special reference to the order of their appearance, a clinical study has been undertaken at University College Hospital by F. J. Browne¹ and the staff of the Obstetric Unit. In 320 toxæmic patients the average time of onset of definite signs of toxæmia was the 28th week, although instances at the 16th, 18th, and 20th weeks are also recorded.

The earliest and most important symptom in Browne's series was *arterial hypertension*. It was present in 56 per cent of cases as the sole evidence of toxæmia, and in many the hypertension underwent spontaneous cure, the blood-pressure falling to and remaining normal without treatment. Browne is unable to confirm Cornell's² statement that a persistently *high diastolic reading* in an otherwise normal patient is a silent signal for more watchfulness on the part of the obstetrician. In 48 per cent the diastolic pressure had been consistently high before the onset of the hypertension, but in 52 per cent it was not raised. On the other hand, an early rise of blood-pressure followed by a more or less prolonged interval during which the blood-pressure is normal was found to be a frequent warning sign of a future permanent hypertension and toxæmia, and occurred in 65 per cent of the patients under investigation.

RELATIVE FREQUENCY OF EARLY SIGNS OF PRE-ECLAMPTIC TOXÆMIA.

EARLIEST SIGN OR SYMPTOM	NUMBER OF CASES	PERCENTAGE OF TOTAL
Hypertension	240	75
Hypertension and headache	5	1.5
Hypertension with sickness and headache	3	0.9
Hypertension and œdema	11	3.3
Hypertension, œdema, and headache	1	0.3
Hypertension and sickness	8	2.5
œdema alone	14	4.3
œdema and sickness	4	1.2
œdema, headache, and sleeplessness	1	0.3
Albuminuria alone	10	3.0
Albuminuria and œdema	4	1.2
Albuminuria, œdema, and hypertension	2	0.6
Albuminuria and hypertension	3	0.9
Headaches alone	3	0.9
Headaches and sickness	2	0.6
Sickness alone	5	1.5
Ante-partum hæmorrhage alone	2	0.6
Ante-partum hæmorrhage with hypertension	1	0.3
Ante-partum hæmorrhage with excessive sickness	1	0.3

Albuminuria succeeded hypertension in 34 patients after a mean interval of 66 days. In only 3 cases did the albuminuria precede hypertension, an observation which tends to emphasize once more the greater value of routine blood-pressure estimations as compared with testing the urine for albumin in the diagnosis of pre-eclamptic toxæmia. Though hypertension commonly precedes the appearance of albumin in the urine the author does not conclude that it is a causative factor, as claimed by the Volhard school. Indeed, he points out that in many cases hypertension is never followed by albuminuria, and also that in a few patients a true toxic albuminuria actually preceded the hypertension (3 cases in a series of 320). Browne is also of opinion that *œdema* and hypertension stand in no etiological relation to one another. Neither is hypertension the cause of œdema nor œdema the cause of hypertension, a view which is in conflict to that expressed by Zangmeister³ and others. In the author's series clinical œdema preceded the hypertension in 15 cases, and in 28 only was œdema preceded by a previous rise in blood-pressure. Browne's observations regarding the relationship between œdema and albuminuria are also not without interest. In 54 patients œdema occurred in the absence of albumin in the urine; in 6 patients the œdema followed the albuminuria, and in 11 the onset of the two symptoms was synchronous. Zangmeister believed

that œdema, by causing swelling of the kidney within its capsule, rendered it anæmic and so caused an 'ischæmic albuminuria'. Epstein¹ and others think that albuminuria causes œdema by rendering the blood-plasma poor in protein, with a resultant fall in its osmotic pressure and the passage of fluid from the blood into the tissues. Browne's figures appear to refute both these theories, and he concludes that the pre-eclamptic toxic agent is *directly* responsible for the independent production of each sign and symptom, whether it be hypertension, albuminuria, œdema, headache, or vomiting.

The most important practical observation is the author's statement that in 75 per cent of cases of pre-eclamptic toxæmia hypertension is the earliest sign. The related incidence of other symptoms is shown in the table on the previous page.

REFERENCES.—¹*Jour. Obst. and Gynecol. Brit. Emp.* 1933, xl, No. 7, 1160; ²*Amer. Jour. Obst. and Gynecol.* 1915, lxiv, 393; ³*Lehrbuch der Geburtshilfe*, 1927, Leipzig; ⁴*Amer. Jour. Med. Sci.* 1922, clxiii, 167.

PRIAPISM. (See PENIS, SURGERY OF.)

PROSTATE, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Radiographic Examination of the Enlarged Prostate.—According to N. Ross,¹ visualization of the intravesical portion of an enlarged prostate is better accomplished by acrocystography than by cystoscopy. After the colon has been emptied the bladder is drained. A small rubber catheter is introduced via the meatus, and air is injected when the patient is on the X-ray table. Using a 20-c.c. Record syringe air is injected slowly to distend the bladder until the patient feels discomfort. The X-ray picture thus obtained gives good information of the size of the intravesical extension of an enlarged prostatic gland.

Preliminary Treatment of the Bladder before Prostatectomy.—R. G. S. Harris² writes on this subject. When an indwelling catheter is employed the open end should never, under any circumstances, be allowed to lie in a urinal. It should be connected to tubing and allowed to drain into a bottle fixed to the side of the bed. In this bottle antiseptic fluid should be placed. Bladder irrigations of a pale-pink solution of potassium permanganate are recommended, after which the permanganate is removed completely by washing out the bladder with sterile water. Finally, 4 oz. of 1-3000 solution of silver nitrate are instilled into the bladder and allowed to remain there for half an hour. By these means, with extremely few exceptions, it has been found possible to cleanse even a grossly infected bladder.

Anæsthesia in Prostatectomy.—W. E. Mitchell³ considers that avertin narcosis with peripheral nerve-block is a step forward in anæsthesia for prostatectomy. Avertin 100 grm. per kilo. body weight, freshly prepared, is run into the rectum whilst the patient is in bed. Sleep ensues in a few minutes. When the patient is on the operating table an epidural injection of 30 c.c. of a 3 per cent solution of novocain is made through the hiatus sacralis into the sacral canal. Finally, 1 per cent novocain is infiltrated into the suprapubic area. Novocain is also injected into the rectus sheath and the cave of Retzius.

Relationship of the Structure of the Enlarged Prostate to the End-results of Prostatectomy.—E. W. Riches and E. G. Muir⁴ studied the prostate gland and the histories of 114 cases of prostatectomy in an attempt to establish a relationship between the type of prostate, the symptoms, and the prognosis after prostatectomy. The following histological classification of benign enlarged prostates is suggested: (1) Glandular enlargements; (2) Intermediate form with some fibrosis in the glandular tissue; (3) Fibrous

PLATE XL

PROSTATECTOMY WITH CLOSURE OF THE BLADDER

(S. H. HARRIS)

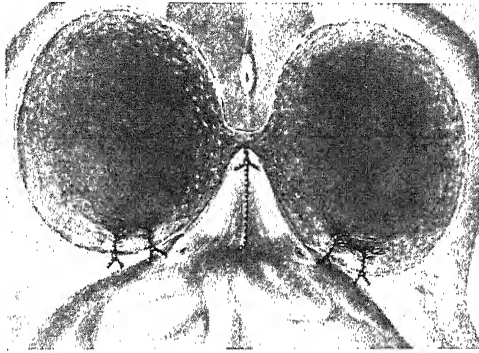


Fig. 1. The trigonal tongue is shown sutured in position as in the Harris operation.

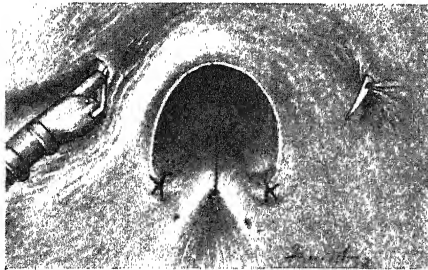


Fig. 2.—Needle in position for the first anterior transverse oblitative suture. Note the width of the bite of the needle. Trigonal tongue in position—two hemostatic sutures only are illustrated for the sake of simplicity.

PLATE XLI

PROSTATECTOMY WITH CLOSURE OF THE BLADDER—*contd*

(S. H. HARRIS)

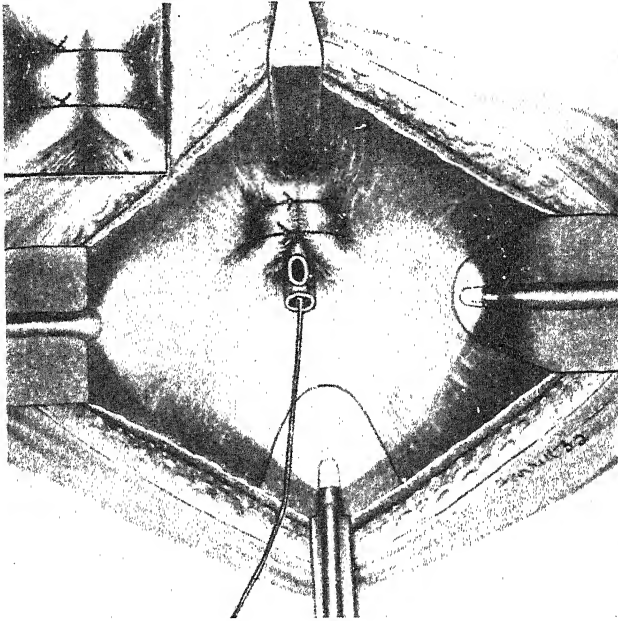


Fig. C.—Second transverse oblitative suture inserted: plastic operation completed: catheter with silkworm-gut transfixion suture in position. The catheter is passed intact and the tip cut off after a second eye has been made.

Inset: Same stage before passage of the catheter. Note that there is no visible raw surface, that the trigonal flap lies on a plane below that of the rest of the bladder base and is firmly bedded in position, and that the lateral edges of the prostatic rim are deeply inverted, thus partly re-forming the side walls of the new prostatic urethra.

prostate; (4) Calculous prostatitis. These authors conclude that the complications are fewest and the mortality lowest in the glandular type. The mortality is highest in the calculous type, and the end-results in the fibrous and calculous types are less satisfactory than those obtained in the glandular variety.

After-treatment of Prostatectomy.—W. E. M. Mitchell⁵ advocates regular breathing exercises and movements of the limbs to minimize the dreaded complication of pulmonary embolus. He also recommends that fruit-juices should be pushed, both for their glucose contents and for their laxative effect. The bowels are likely to move naturally on the third day after operation; enemata should be avoided.

Prostatectomy with Closure of the Bladder.—S. H. Harris,⁶ of Sydney, evolved the operation of suprapubic prostatectomy with reconstruction of the prostatic bed, combined with primary closure of the bladder. This operation is the culmination of a modern tendency to convert the somewhat crude technique of the suprapubic operation in its original form into a really refined surgical procedure. The Harris operation ensures hæmostasis, obviates leaving a large raw area in the base of the bladder, and achieves the highest aim of all modern operative methods—namely, the prevention of infection. Briefly, the operation is carried out as follows. Through a reasonably large bladder incision the prostate is enucleated with the finger, and tags and adenomatous remnants are removed under vision. Hæmostasis is effected by placing sutures, particularly at the posterior free border of the prostatic bed (*Plate XLA*), usually two on each side being necessary. A tongue of bladder mucosa from the region of the trigone is sewn down by a deeply placed stitch (*Plate XLA*), so as to form a new posterior wall of what is to be the prostatic urethra. Two deeply-placed transverse stitches narrow the gaping prostatic bed anteriorly (*Plate XLB*). A catheter is passed from the meatus into the bladder. To the tip of the catheter is attached a silkworm-gut suture (*Plate XLI*). This suture passes out through the suprapubic wound, which is now closed, the bladder wall being approximated by inverting the stitches. Certain special instruments are necessary for this operation; among them are a boomerang needle-holder and an illuminated bladder retractor. R. J. Silvertown⁷ uses a special instrument called a prostatic cavity elevator, which is introduced into the rectum to facilitate placing of this stitch into the bladder neck.

Post-operative Treatment.—After the bladder has been washed out gently on the operating table the majority of patients require no interference with the catheter, though if any doubt is entertained about the continuity of the drainage it is washed through with $\frac{1}{2}$ oz. of 1-3000 solution of silver nitrate. Irrigation beyond this amount is not permitted. The catheter is retained until the tenth day, when the strand of silkworm gut, which was tied to a glass rod, is cut and the catheter removed. From a personal experience of Harris's method, A. C. Morson and J. E. Semple⁸ are struck by the absence of shock of the operation and also by the extremely satisfactory control of hæmorrhage. Of 371 cases operated upon by the originator of the technique there have been 10 deaths, a mortality of 2.7.

Transurethral Resection of the Prostate.—Before undertaking transurethral resection E. G. Alcock⁹ as a routine employs air cystograms and urethrograms with a jelly made of iodized oil. He describes this procedure as invaluable. He finds that complications after transurethral resection are not infrequent. Some hæmaturia occurs during the third and fourth weeks in 70 per cent of cases. Infection is the commonest and most serious complication. Epididymitis is as frequent as it is after prostatectomy. It is a wise precaution to ligate the vasa as a routine.

W. J. Engel and W. E. Lower¹⁰ describe the following cases as unsuitable for transurethral prostatic resection: (1) Pronounced enlargement of the prostate per rectum; (2) Cystoscopically—(a) middle lobe very large, (b) marked intravesical lateral lobes, (c) marked intra-urethral lateral lobes, (d) lengthened prostatic urethra.

H. C. Bumpus¹¹ says the low mortality of transurethral resection at the Mayo Clinic can be attributed largely to the extreme care in the prevention of sepsis. The operation is carried out with knife punch, and coagulation is used only to control bleeding. Thus a potent source of secondary infection in coagulated necrotic tissue is largely eliminated. The indwelling catheter is kept in place no longer than forty-eight hours. It is connected to a sterile bottle. This bottle is not taken to the lavatory to be emptied, but when full is immediately replaced by another empty sterile bottle. The connection of the catheter to the bottle is air-tight, and it is disconnected only for the daily lavage of the bladder, which is conducted under the most rigid aseptic conditions.

G. J. Thompson¹² is very enthusiastic about the advantages of transurethral prostatic resection. He details the technique generally employed at the Mayo Clinic, and shows the order in which portions of the enlarged prostate should

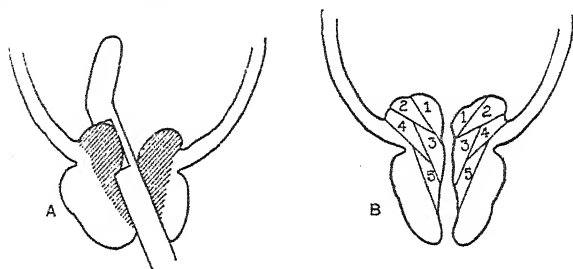


Fig. 39.—Transurethral resection of the prostate. A, Engaging an intravesical portion of the tissue. B, Order in which pieces of tissue are removed. (G. J. Thompson.) (From 'California and Western Medicine'.)

be removed (Fig. 39). In 1932 twenty physicians were subjected to transurethral resection at the Clinic, with very satisfactory results in so critical observers.

Carcinoma of the Prostate.—The number of cases of carcinoma of the prostate appears to be increasing. F. L. Hoffman,¹³ from a statistical survey, finds the death-rate has more than doubled during the past ten years.

Various clinical types are met with in practice (H. Bailey and R. J. M. Love¹⁴):—

1. *The 'Pathological'.*—On histological examination about 10 per cent of all enucleated prostates, presumably benign, are found to be carcinomatous.

2. *The Scirrhus.*—When examined per rectum the prostate feels stony-hard and irregular.

3. *The Encephaloid.*—This was called by Guyon 'pelvo-prostatic' carcinoma. It infiltrates rapidly and mats the pelvic viscera into a conglomerate mass.

4. *The Hidden.*—The first manifestation is a secondary growth in bone, perhaps complicated by a spontaneous fracture. E. G. Muir¹⁵ finds the sites of skeletal metastases in order of frequency are: vertebrae, pelvis, ribs, femur, skull, and clavicle.

T. G. I. James and N. M. Matheson¹⁶ have observed 50 late cases of carcinoma of the prostate and studied the distribution of metastases.

Involvement of the perineum is very rare. Metastases in the skin are also not common, but they observed a case of a secondary nodule in the skin of the forehead. Deposits in the regional lymph-glands are a constant feature in advanced cases. More distal groups of glands are affected from time to time. In 10 per cent of cases the inguinal glands are involved. The cervical group and axillary were also found affected in some instances by these observers. In their study of these late cases bone metastases were nearly always found, and the involvement was widespread.

B. S. Barringer (quoted by Hoffman¹²) says carcinoma of the prostate still holds its place as the most baffling of the urological conditions. In but a small percentage of cases is the diagnosis made sufficiently early to give any sort of treatment a fair chance of success.

DIAGNOSIS.—F. E. Feilden¹⁷ is of the opinion that cystoscopy is often of considerable help in diagnosis; when the instrument is passed it appears to be gripped in the posterior urethra and passes with a peculiar, dry, grating sensation. Cystoscopic examination sometimes reveals irregular projections and the trigone may be raised by the growth.

So uncertain are clinical methods in the diagnosis of early carcinoma of the prostate that R. S. Ferguson¹⁸ recommends aspiration biopsy in all suspected cases. The patient is placed in lithotomy position and the skin of the perineum is cleansed. A wheal of 1 per cent novocain is raised on the skin to one side of the middle line an inch in front of the anus. This is followed by infiltration of novocain down to the prostatic capsule guided by the index finger in the rectum. The needle, which should be 4 or 6 in. long and of 18 gauge, is guided into the suspected portion of the gland (*Fig. 40*). The plunger of the syringe is withdrawn, creating a high vacuum. A small plug of tissue is thus drawn up into the needle, which is removed. The material in the needle is expressed on to a glass slide, and stained according to the instructions given in the paper. [Many pathologists would not be willing to hazard a diagnosis on such a small amount of tissue, but in many clinics favoured with a pathologist able and willing, a reliable diagnosis of carcinoma can be made on the material obtained by this method.—H. B.]

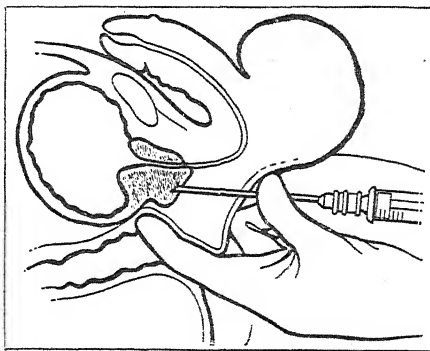


Fig. 40.—Aspiration biopsy of a suspicious nodule of the prostate. (After Ferguson.)

TREATMENT.—There is still no general agreement as to the best method of treating carcinoma of the prostate. H. H. Young (quoted by E. G. Muir¹⁵) has had considerable success by complete removal of the prostate by the perineal route, while A. C. Morson has effected a similar clearance through the suprapubic route. R. Coffey believed that the only radical operation which has a chance of success is complete prostatectomy and cystectomy. F. E. Feilden¹⁷ finds that the results of treatment of carcinoma of the prostate by radium are not encouraging, and it is his view that transurethral diathermy should be employed seldom. He states that the most satisfactory palliative method is suprapubic cystostomy.

R. Chwalla¹⁹ also finds that as far as longevity is concerned suprapubic drainage gives as good results as the use of radium.

Muir shows that life may be prolonged by deep X-ray therapy, but an objection to this treatment is the extreme nausea which it produces. The administration of liver extract intravenously has been found to mitigate this unpleasant complication.

Prostatic Calculi.—These are formed by deposits of calcareous material on the corpora amylacea. They are often scattered throughout the gland, and give a characteristic dotted appearance upon the X-ray. In five cases H. G. Hammer and T. A. Dykhuizen²⁰ were able to elicit crepitation upon rectal examination.

Chronic prostatitis is often associated with calculi, and prostatic calculi are not an infrequent accompaniment of carcinoma (E. G. Muir¹⁵).

Prostatic calculi can be removed by the suprapubic route together with remains of the prostate which contains them. A satisfactory method of evacuating a nest of calculi is transurethral resection.

REFERENCES.—¹*Lancet*, 1933, Jan. 7; ²*Med. Jour. Australia*, 1934, March 24, 407; ³*Lancet*, 1933, Aug. 12, 350; ⁴*Brit. Jour. Surg.* 1933, xx, 366; ⁵*Lancet*, 1933, Aug. 12, 350; ⁶*Brit. Jour. Surg.* 1934, Jan., 434; ⁷*Austral. and N. Z. Jour. Surg.* 1934, Jan., 276; ⁸*Brit. Jour. Urol.* 1934, Sept.; ⁹*Jour. Amer. Med. Assoc.* 1933, Oct. 28, 1355; ¹⁰*Ibid.*; ¹¹*Ibid.*; ¹²*Calif. and Western Med.* 1934, Jan., 1; ¹³*New Eng. Jour. Med.* 1934, March 8, 507; ¹⁴*Short Practice of Surgery*, 1935, 2nd ed.; ¹⁵*Lancet*, 1934, March 31, 667; ¹⁶*Brit. Jour. Urol.* 1934, Sept., 235; ¹⁷*Proc. Roy. Soc. Med.* 1934, xxvii, May, 947; ¹⁸*Canad. Med. Assoc. Jour.* 1933, Nov., 497; ¹⁹*Zeits. f. urol. Chir.* 1933, Nov., 154; ²⁰*Amer. Jour. Surg.* 1934, April, 119.

PRURITUS VULVÆ.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

C. D. Kennedy¹ discusses the treatment of this troublesome condition with injections of A.B.A. (*amido-benzoic acid*), which has proved successful for refractory cases of pruritus ani. He points out that there are two kinds of pruritus vulvæ, the one where the itching results from a lesion, as in diabetes, kraurosis vulvæ, etc., and the other where no primary cause, local or general, can be found. He discusses various forms of treatment already in common use—removal of the primary cause, when present; local cleanliness, alkaline or bran baths, local applications, sedatives, and antiseptics, X-ray therapy, etc. A.B.A. consists of amido-benzoic acid ethyl-ester 3 per cent, benzyl alcohol 5 per cent, ether 10 per cent, suspended in an oily medium. He gives weekly injections of 2 c.c. just beneath the skin in such a manner as to ensure that a fan-shaped area is treated. If the material is injected into the deeper tissues there is distinct risk of abscess formation. At each succeeding visit a different zone is dealt with until eventually the whole vulvar region has been infiltrated. The number of injections in 15 patients was from 3 to 33. Cure, by which is meant absolute freedom from irritation, resulted in 5 cases; 5 were much improved; 4 slightly improved; and in 1 there was no improvement.

REFERENCE.—¹*Edin. Med. Jour.* 1933, Sept., 125.

PSORIASIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

PROGNOSIS.—R. Hallam¹ has reported the after-histories of 43 cases of psoriasis who had attended his department between ten and fifteen years previously. In only 4 cases had the patients remained free from the disease. In nearly three-quarters of the cases the onset of the disease had been under the age of 21 years.

REFERENCE.—¹*Brit. Jour. Dermatol. and Syph.* 1934, May, 221.

PSYCHONEUROSES AND PSYCHOTHERAPY. (See NERVOUS DISORDERS IN GENERAL PRACTICE; NEUROSES.)

PSYCHOSES, NASAL SINUSITIS IN.*H. Devine, M.D., F.R.C.P.*

P. K. McCowan¹ states that the importance of toxæmia as a causative factor in the psychoses is still undetermined. A recent monograph shows that in Birmingham mental hospitals these infections are found in the large majority of psychotics, and are considered to be the most important causal factor in most forms of mental disease.² T. A. Clarke and A. K. McCowan in the same monograph,³ however, report that, working at one of the Kent county mental hospitals, they found the incidence of sinusitis to be about 5 per cent. It has been the practice at Cardiff City Mental Hospital to carry out a routine otorhinolaryngeal examination of every admission, and this paper is based on the results of examination and treatment of the 807 consecutive admissions to the hospital during the three years 1930-2.

In 25 cases (31 per cent), including 8 cases of sinusitis, the tonsils were found to be hypertrophied, cryptic, or frankly septic, sufficient to justify tonsillectomy. The diagnoses in these cases were: manic-depressive, 8 (2 with sinusitis); involutional melancholia, including 1 puerperal case, 2 (both with sinusitis); schizophrenia, including 1 puerperal case, 6 (1 with sinusitis); toxic psychosis, 5 (3 with sinusitis); epileptic psychosis, 2 (1 with sinusitis); secondary dementia with attacks of confusion, 1; and chronic epidemic encephalitis, 1.

The results of tonsillectomy were as follows:—

In 15 of these cases the physical health improved after operation, accompanied by an improvement in the mental state in 9 (5 with sinusitis), viz., 3 manic-depressives (1 with sinusitis), 1 hebephrenic (without sinusitis), 4 toxic-exhaustives (3 with sinusitis), and 1 epileptic (with sinusitis). In the 8 cases with sinusitis and tonsillitis, of whom 5 improved as a result of treatment, it is impossible to say how much of the improvement was due to tonsillectomy. In the other 4 cases which improved as a result of tonsillectomy, the impression gained was that, while in none of the cases was toxæmia from a tonsillar focus the primary cause of the psychosis, it was probably contributory in all, and the tonsillectomy at least hastened the rate of recovery. In all 4 the tonsils were frankly septic, and the 2 manic-depressives themselves dated their improvement from the operation. Neither of the puerperal cases responded to this treatment.

McCowan feels that some explanation seems to be called for to account for the grave discrepancy in the relative importance ascribed to sinusitis as a cause of mental disorder by the Birmingham and Cardiff schools of workers. When it is appreciated that at Birmingham sinusitis is found in over 80 per cent of the patients, while at Cardiff only 24 cases were found in 807 consecutive admissions—i.e., 3 per cent—it appears that the primary difference must lie in what is to be regarded as sinusitis. Even in the 51 carefully selected cases subjected to proof puncture at Cardiff, only 24 (47 per cent) showed sinusitis. At Cardiff it is felt to be quite unjustifiable to diagnose sinusitis merely on the ability to culture a few organisms from sinus washings. It is highly probable that healthy controls would approximate very closely to psychotics in this respect. Secondly, even if it be provisionally granted that the isolation of a few organisms from the nasal sinuses is proof of infection, this does not seem to warrant the further assumption that such infections should necessarily be regarded as a contributory factor in any psychosis present. The ground on which Birmingham and Cardiff certainly do agree is that in the case of overt sinusitis correction of this condition is imperative, as there appears little room for doubt that in an appreciable proportion of such cases definite improvement results from treatment.

The writer feels that investigation of the kind under discussion must be

carried out in a highly critical manner. The work must be regarded as still in the experimental stage, and the interpretation of results as controversial; and it would be unfortunate if extravagant claims should bring into disrepute what appears to be a hopeful method of attack on the psychoses. His summing up of the position is that infection of the nasal sinuses and tonsils is an important causal factor in a small minority of psychotics, that its eradication in these cases leads to cure or amelioration, and that it should always be looked for and treated vigorously when present. Especial emphasis should be laid on the importance of these infections in the toxic-exhaustive psychoses, since here they appear to be comparatively common and frequently causal.

The rhinolaryngeal and bacteriological investigations were carried out by Mr. A. A. Pritchard and Dr. H. A. Scholberg, Consulting Rhinolaryngologist and Pathologist respectively to Cardiff City Mental Hospital.

REFERENCES.—*Lancet*, 1933, ii, 853; *Jour. of Ment. Sci.* 1932, lxxviii, 705; *Ibid.* 459.

PSYCHOSES, SOMNIFAINE NARCOSIS IN.

H. Devine, M.D., F.R.C.P.

R. Ström-Olsen¹ gives an account of his investigations into the use of somnifaine in the treatment of the psychoses. During the last decade prolonged narcosis has been accepted as a most valuable form of treatment in mental disorder, but many psychiatrists refuse to use it because of its dangers. The present paper presents clinical and laboratory evidence that a method has been devised whereby most of the toxic symptoms can be obviated. It is claimed that a large proportion of these symptoms is due to upset of carbohydrate metabolism of the liver and heart by the narcotic, and that in the administration of insulin and glucose as an integral part of the treatment a rational method of prevention has been evolved.

Hitherto somnifaine treatment has been regarded as an imperfect form of therapy in mental disorder owing to the toxic risks, which frequently required the treatment to be stopped before any alleviation of the mental illness could take place. The mortality in a large series of cases collected by Müller was 5 per cent. These serious drawbacks have tended to bring the narcotic treatment into disrepute. The fact, however, that by prolonged narcosis we are able to allay psychotic symptoms not only temporarily, but often permanently, is in itself such as advance that it warranted a search for modified methods of narcosis which would diminish or abolish toxicity. Ström-Olsen and Quastel describe a modification of technique by which it is possible to eliminate dangerous toxic manifestations of somnifaine narcosis.

Toxic symptoms which frequently accompany the narcosis are fully discussed and their significance pointed out. Of these the most important are ketosis, with diminished glucose tolerance, fall of blood-pressure, tachycardia, circulatory collapse, oliguria, albuminuria, disturbances of co-ordination (including difficulty in swallowing), pyrexia, and skin-eruptions of an erythematous type. Other changes to be noted are leucocytosis, fall in blood-calcium, and slight rise in the blood-urea. Epileptiform convulsions did not occur.

A disturbance of the carbohydrate metabolism of vital organs occurs during prolonged narcosis with somnifaine—a fact which has not previously been recorded in the literature. Clinical evidence of this is seen in the frequent development of ketonuria, which at Cardiff Hospital has always been regarded as a contra-indication for further treatment. *In vitro* experiments by other workers in the Hospital have shown that narcotics inhibit the oxidation by the brain, liver, and heart of substances such as glucose and lactic acid, which are

important in carbohydrate metabolism, the inhibitions being much greater with the brain than with other organs. Ketonuria is the outward manifestation of this disturbance, but it is claimed that other symptoms, such as circulatory collapse, can be ascribed to the same fundamental cause.

The knowledge that carbohydrate metabolism was affected by narcotics led to the adoption of the administration of insulin and glucose during narcosis with a view to eliminating dangerous symptoms. Of 46 treatments on 40 patients, 14 were carried out without this additional measure, and narcosis had to be prematurely stopped in 5, 4 others being continued with smaller doses. In 15 treatments insulin and glucose were given on the appearance of ketonuria and major toxic symptoms, with the result that these manifestations entirely disappeared within forty-eight hours. In 17 instances where insulin and glucose were administered from the very beginning no ketosis or other serious complications arose. These results demonstrate that the narcotic treatment has been rendered perfectly safe by means of the modification described.

Myocardial degeneration, arteriosclerosis, marasmus, and respiratory disorders constitute the chief physical contra-indications for somnifaine treatment.

J. H. Quastel² states that as regards the rationale of prolonged narcosis treatment we are in the region of speculation. He suggests, however, a hypothesis built on the facts observed. If we judge a functional psychosis to be due primarily to a hyperactivity of certain nervous structures, or a depression of activity of others, the end-result is the same; there will exist an abnormal production of certain metabolites in the brain, or possibly of harmful substances, whose presence brings about a disturbance in the normal equilibria of the nervous system. In prolonged narcosis a depression of nervous activity is secured, compared with which the disturbance due to the abnormal metabolites or harmful substances may be regarded as small. During the long period of narcosis, these substances—whether they be metabolites produced in excess of their usual quantities or toxic substances—are eliminated by the body and not replaced because of the lowering of activity due to the narcosis. After a sufficiently long period of narcosis the body is allowed to recover, and assuming no permanent damage to the nervous system this should become relatively free from the abnormal conditions present before narcosis. Granting such a view, it would follow that organic psychoses will not benefit from prolonged narcosis treatment, nor should those psychoses which are due to the presence of an active septic focus benefit (except temporarily) until the latter has been eliminated. Experience so far agrees with these conclusions, but it is early yet to make any definite decision.

REFERENCES.—¹*Jour. of Ment. Sci.* 1933, lxxix, 638; ²*Psychiatric Quart.* 1934, viii, 227.

PTOSIS.

Sir Stewart Duke-Elder, M.D., F.R.C.S.

A new operation for the relief of congenital ptosis has been introduced by R. A. Greeves¹ (*Figs.* 41-43). He divides such cases into three categories: (1) Partial ptosis with fair independent levator action; (2) Complete ptosis with little or no levator action but with good upward movement of the globe; (3) Complete ptosis with deficient upward movement of the globe. The operation is designed for the second and much the commonest class—namely, those cases with little or no levator action but a good upward movement of the eye.

The operation is essentially the reverse of Motais' operation; instead of attaching a slip of the tendon of the superior rectus to the tarsal plate, the

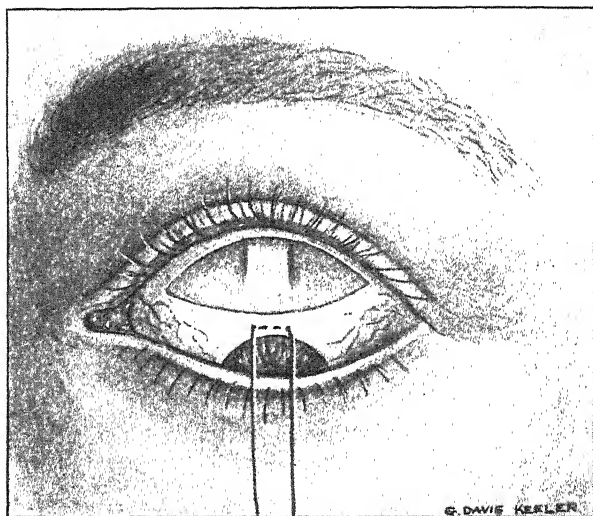


Fig. 41.—Showing the controlling suture, and the exposed superior rectus tendon.

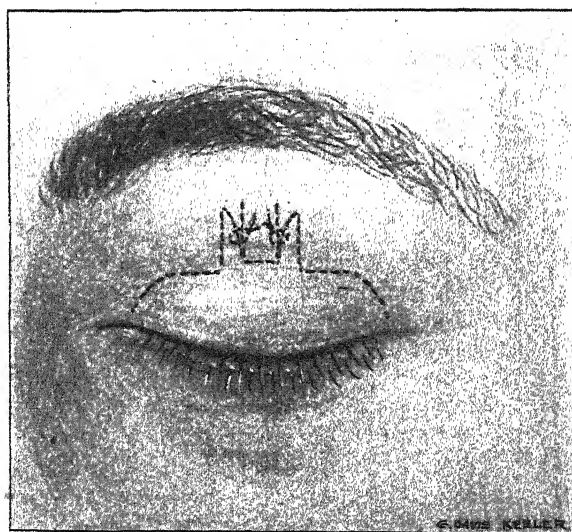


Fig. 42.—The dotted lines indicate the position of the tarsal plate, tarsal strips, superior rectus tendon, and sutures, when the operation is completed.

(Figs. 41–43 by kind permission of the 'Proceedings of the Royal Society of Medicine'.)

tarsal plate is attached to the tendon of the superior rectus. A controlling suture is first inserted in the conjunctiva, immediately above the cornea, and the eye depressed as far as possible by its means. The superior rectus tendon and its attachment to the globe are then exposed by a horizontal incision through the conjunctiva and a squint hook is passed under the tendon; a silk thread is then pushed under the tendon and the hook withdrawn, the two ends of the thread being secured by Spencer-Wells forceps. This thread is now used to control the eye in place of the preliminary conjunctival suture, which may be removed.

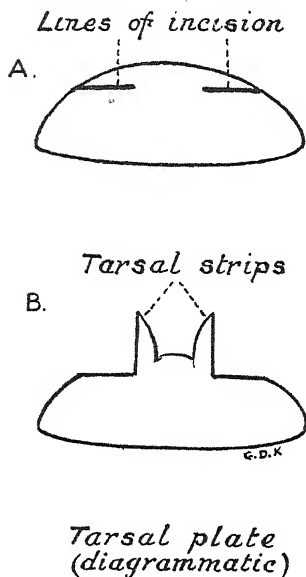


Fig. 43.—Diagrams illustrating the operation shown in Figs. 41, 42.

a similar suture being passed through the other strip and the other edge of the tendon. The sutures are drawn tight without being tied, in order that a judgement may be made of the relative positions of the eye and eyelid; the position of the edge of the lid should be such that it slightly overlaps the upper part of the cornea. If the position of the lid is judged not to be correct, those parts of the sutures which have been passed through the tendon should be withdrawn and re-inserted in the tendon in a suitable position, either higher up or lower down as required. This part of the operation requires care and judgement, especially as the final position of the lid remains permanently unaltered; this fact is one of the most satisfactory features of the operation. It is not necessary to insert conjunctival sutures.

REFERENCE.—¹*Proc. Roy. Soc. Med.* 1933, Sept., 1478.

PULMONARY EMBOLISM. (See CORONARY ARTERY DISEASE.)

PULMONARY TUBERCULOSIS. (See TUBERCULOSIS, PULMONARY.)

PURPURA, THROMBOCYTOPENIC. (See BLOOD DISEASES.)

PYLORUS, CONGENITAL HYPERTROPHIC STENOSIS OF.*John Fraser, Ch.M., F.R.C.S.Ed.*

Congenital hypertrophic stenosis of the pylorus is the subject of a careful and interesting analysis by H. L. Wallace and L. B. Wevill.¹ These observations are based upon the study of 145 cases treated in the Royal Edinburgh Hospital for Sick Children during a twelve-year period from 1922 to 1933. The authors bring out the accepted fact that the disease shows a peculiar affinity for the male sex, the proportion being 6.25 to 1, and they remind the reader that the proportional birth incidence of males to females in Scotland is 1.02 to 1. The subject has something more than mere academic interest, for the explanation is likely to throw light on the vexed question of the etiology, but no suggestion is offered in solution of the problem.

A point of practical significance is made when it is pointed out that on an average an interval of four weeks elapses between the first manifestation of the disturbance and the establishment of the diagnosis, but, if we read the statistical tables correctly, it would seem that admission to hospital and correct diagnosis are synonymous. Such a deduction is open to question, for it is clear that in many cases the diagnosis is made by the practitioner who, wisely or not, employs conservative treatment before enlisting hospital aid. On this point therefore the statistical conclusions are open to criticism.

The fact that the disease is mainly encountered in first-born children is established, and the interesting figures are shown that 56.6 per cent of the cases were actually the first-born, while 28 per cent ranked second and third in the family circle. This feature was often alluded to in the teaching of the late Dr. John Thomson, who stressed the point as an argument in favour of his view that the error depends upon a defective co-ordination between the musculature of the stomach and the pylorus.

In an analysis of the clinical features it is pointed out that the demonstration of a palpable pyloric tumour is possible in only 24 per cent of the cases; on the other hand, visible peristalsis is an almost constant finding (97.2 per cent). In 89.7 per cent vomiting was the first and only symptom, constipation not being noticed until a later date. In 7 cases (4.8 per cent) constipation was the first symptom, while in 9 cases (6.2 per cent) vomiting and constipation were reported as having begun simultaneously. This section of the report is a helpful and valuable study.

In so far as the treatment is concerned, all the cases were treated by operation on the Rammstedt principle. The mortality-rate was 24.8 per cent, a record which may be regarded as high, particularly when it is contrasted with such figures as those published by Lanman and Mahoney (*MEDICAL ANNUAL*, 1934, p. 386). This aspect is appreciated by the authors, for they proceed to discuss at some length the possible explanation of what they describe as an "alarming operation mortality". The various causes of death were collapse 66.6 per cent, enteritis 25 per cent, sepsis 5.6 per cent, peritonitis 2.8 per cent. Excluding the third and fourth of these as surgical complications which must inevitably form an element of risk, the authors conclude that the high mortality depends upon the fact that "nearly 25 per cent of infants who come to operation for congenital pyloric stenosis are in such a weak state that they are unable to survive even the comparatively minor operative procedure which is adopted." This argument amounts to a recognition of the fact that, if the mortality figures are to be improved we must aim at the earliest possible diagnosis; reasonable prospects of successful treatment will follow.

P. Nissem and P. Boecker² record the results of 46 cases operated on by the Rammstedt technique. They point out that a complete operation may not be followed by entire relief of symptoms, for in a considerable percentage of

these cases (34 in a total of 46) regurgitation and vomiting persisted for as long as eight days following the operation. This they ascribe to irritation of the nerve-fibres as the result of division of the sphincter and manipulation of the stomach wall.

Professor J. Ochler,³ in an article entitled "Results and Experiences in the Operative Treatment of Congenital Pyloric Stenosis", reports a 14 per cent mortality in a total of 42 cases. He refers to the persistence of vomiting which is sometimes encountered in the post-operative period, and is inclined to ascribe its occurrence in certain instances to an incomplete division of the more distal circular fibres of the sphincter.

R. Leibovici⁴ alludes to the same problem of post-operative vomiting. He recounts the history of a child operated on when 27 days old. The division of the hypertrophic pylorus was most carefully completed, and there appeared to be no possibility of an incomplete operation, yet vomiting persisted for twenty-six days in spite of a great variety of therapeutic measures. As a last resort the child was sent to the country; vomiting ceased immediately, and from that time it made an uninterrupted recovery. Leibovici believes that this was an example of what he terms "gastric spasmophilia", and he recommends that such a development should be treated by the use of belladonna and of calcium chloride. In summary he states that, if post-operative vomiting appears, it has one or other of the following explanations: incomplete division of the hypertrophied muscle, intolerance of milk diet, "gastric spasmophilia", or injury to the duodenum with resulting peritonitis.

REFERENCES.—¹*Brit. Med. Jour.* 1934, June 30, 1153; ²*Deut. Zeits. f. Chir.* 1933, July, 34; ³*Zentralb. f. Chir.* March 17, 611; ⁴*Presse méd.* 1934, April 4, 535.

RADIUM THERAPY. (See CANCER; X-RAY AND RADIUM THERAPY.)

RECTUM AND ANUS, DISEASES OF.

J. P. Lockhart-Mummery, F.R.C.S.

Fibrous Stricture of the Rectum.—Fibrous stricture of the rectum may be due to: (1) Traumatism, either accidental or operative; (2) Infective proctitis; (3) Abscess of the rectum and perirectal tissues; (4) Specific inflammation. Cases are divided into two classes: those where the stricture is more or less of a diaphragm; and tunnel strictures where the stricture involves an inch or more of the bowel, and not only the bowel wall but the surrounding tissues are involved in the fibrosis.

At one time most strictures of the rectum which had not resulted from traumatism were supposed to be the result of syphilis and are even described as such in many text-books to-day, but of late years there has been much doubt whether syphilis is the cause of rectal stricture. In the first place spirochaetes have never been demonstrated in the tissues, and in the second place anti-syphilitic treatment appears to be perfectly useless in most of the cases, and only a few give a positive Wassermann reaction.

A specific form of fibrous stricture is now attributed to 'fourth disease' or *lymphogranuloma inguinale*. This condition is believed to be due to a virus infection which causes in course of time a hyperplastic fibrosis in the perirectal tissues and in the inguinal glands. The infection is apparently conveyed by sexual intercourse, and the primary lesion occurs on the genitalia. On this account the granulomatous lesion is most commonly seen in the inguinal glands in men and the lymphatics round the rectum in women. The primary sore in women probably occurs either on the cervix or on the posterior vaginal wall, where the lymphatics drain into the perirectal lymphatics. The condition was first described in 1913 by Nicholas and Favre, and in 1925 Frei discovered

an intradermal test, since then known as the Frei test. It appears very doubtful whether the Frei test is really reliable as a means of diagnosing the condition: it is like the tuberculin test, and probably proves nothing more than the susceptibility of the individual to infection. The fact that the condition is due to venereal infection probably explains why it has often been confused with syphilis, which often no doubt accompanies it. The disease has given rise to a great deal of confusion among the different writers at different times. This is due to the fact that we know little or nothing about the primary stages of the disease or the primary sore, when there are apparently no symptoms, and our knowledge is gained almost exclusively from the late end-results, which do not probably occur for very many months or even years, when the inguinal glands break down, or the rectum becomes densely fibrosed. The disease is very insidious, and often many years elapse before the patient comes up for treatment on account of rectal stricture, by which time secondary infection and abscesses will probably have occurred.

During the last year a number of papers have appeared on this specific form of stricture of the rectum which is believed to be due to 'fourth disease'. M. J. Sénèque¹ discusses the relationship between inflammatory stricture of the rectum and 'fourth disease'. Eleven cases of various forms of rectal stricture came under his observation at the Hôtel Dieu, 9 of which gave a positive Frei reaction. In a number of cases inoculation was carried out into guinea-pigs and an emulsion of the inguinal glands of the guinea-pig inoculated into the brain of a monkey, the monkey subsequently developing meningo-encephalitis.

D. Bloom² gives a very full review of the literature of this condition and describes seven cases which have come under his own observation. He stresses the importance of very careful investigation of suspicious cases by means of the Frei test and inoculation into monkeys.

C. E. Martin³ believes that many of these strictures of the rectum are due to lymphogranuloma inguinale, especially in the negro race. He considers the condition incurable and thinks that it progresses slowly to a fatal issue. He advocates making the disease certifiable so as to prevent its spread.

H. Strauss⁴ reports 72 cases of stricture of the rectum collected from the literature, and in no fewer than 69 there was a positive Frei reaction.

As already stated, the tests for this condition cannot as yet be considered very reliable and there does not appear to be any means of establishing the diagnosis with certainty in a difficult case. The view that there does exist a specific form of fibrous stricture of the rectum caused by a venereal virus infection is now generally accepted. For reasons already stated the rectal lesions are most commonly found in women. The lesions appear to be very slow in developing and to be progressive. Until considerably more accurate observations have been made on cases of 'fourth disease' it will be very difficult to distinguish cases of this condition from those due to chronic sepsis from infection by the ordinary septic organisms.

TREATMENT.—Where a definite diagnosis of 'fourth disease', or lymphogranuloma inguinale, has been established, some form of treatment to kill the virus and prevent the condition being progressive would seem to be indicated. There is, however, very little evidence that such treatment, even if successful in destroying the virus, has much effect in causing regression of the stricture, and surgical operation is indicated.

The treatment recommended is by intravenous injections of *gold* or *tartar emetic*. An intravenous injection of 1 per cent solution of tartar emetic is given twice a week, starting with 2 c.c. and increasing to 7 c.c. This may at the same time be combined with subcutaneous and intramuscular injections

of *lymphogranuloma inguinale antigen*. S  n  que apparently uses submucous injections of Lugol.

It seems that none of the methods of treatment which aim at destroying the virus are very satisfactory, and all of them are very unpleasant and even dangerous. *Surgery* seems to afford the best means of treating the condition—colostomy either permanent or temporary, and resection of the strictured portion of the rectum after all sepsis has been cleared up. In a suitable case a resection of the rectum with restoration of the canal by suturing the end of the colon to the lower stump of the rectum can be performed and the temporary colostomy closed after the wound has healed. This gives a perfect result as restoration of function is complete. This type of stricture is not suitable for dilatation.

(See also LYMPHOGRANULOMA INGUINALE.)

Prolapse of the Rectum.—In discussing the treatment of rectal prolapse W. E. Miles⁵ divides the different operative procedures as follows: (1) Narrowing the anal orifice; (2) Fixation of the rectum to the pelvic wall; (3) Suspension of the rectum from above; (4) Removal of the prolapse by recto-sigmoidectomy. For complete prolapse of the rectum where coils of small intestine come down in the wall complete removal is the best procedure. The operation is best performed under percain spinal an  sthesia and gas and oxygen, and is as follows: The mucous membrane is divided by a longitudinal incision on the front wall, and by blunt dissection the mucous membrane is separated from the underlying muscular coat as far laterally as possible. The mucosa is now divided transversely at the upper level of the prolapse, the bleeding being controlled with forceps. The muscular coat of the bowel is now incised longitudinally and the peritoneal pouch exposed. Any intestine in the pouch is returned into the abdomen. The main muscular coat of the rectum is now divided transversely throughout its circumference at the upper level of the prolapse. The cut margin of the peritoneal pouch is sutured to the pelvic colon so as entirely to shut off the peritoneal cavity. Next the pelvic pedicle of the mesocolon is ligatured, and finally the colon is divided transversely half an inch above the ligature upon the vascular pedicle. With a continuous catgut suture the pelvic colon is sutured to the stump of the rectum, first the muscular coat and then mucosa to mucosa. Having passed a finger to make sure there is no stricture the stump is now returned within the anus. The bowels are kept confined for four to five days and then opened with enemata. The operation appears to be reasonably safe and the end-results are good.

F. W. Rankin and J. T. Priestley⁶ also describe the treatment of rectal prolapse. They favour the operation suggested by Moschowitz in which the cul-de-sac of Douglas is obliterated with stitches from the abdominal aspect. A series of purse-string sutures are placed so as to obliterate completely the entire pelvic 'cul-de-sac,' starting at the bottom of the pouch. This operation has not been received with much favour in this country. In the first place it is rather a severe abdominal procedure, and there is some risk of small-gut obstruction owing to hernia of the gut between the sutures.

Congenital Malformations of the Rectum and Anus.—W. E. Ladd and R. E. Gross⁷ discuss the various congenital anomalies of the anus and rectum, which are said to be present in about one in every 5000 children. There were 162 cases in the Boston Children's Hospital between 1908 and 1932. They distinguish four main types: (1) Incomplete rupture of the anal membrane; (2) Imperforate anus; (3) Rectal pouch ending blindly, either in pelvis or above pelvis; (4) Anus and pouch normal, but rectum ending blindly. The distribution of the cases was as follows: Type 1, 21; Type 2, 6; Type 3, 117;

Type 4, 18. There were associated congenital abnormalities in about 28 per cent of the cases.

TREATMENT.—These cases were treated as follows: In Type 1 repeated dilatation was usually all that was necessary, but when the anal canal was unyielding it had to be excised and the rectal mucosa brought down to cover the defect. In Type 2 simple cruciate incision and dilatations sufficed. Types 3 and 4 were treated by a perineal operation, when the pouch was low enough, and the rectum was brought down to the skin through the anal sphincter muscle. When the pouch was high and prohibited a successful operation, a colostomy was resorted to: 86 per cent of the Type 3 cases were amenable to treatment by the perineal approach, and 66 per cent of the Type 4 cases.

Sarcoma of the Rectum.—W. M. Shedden,⁸ in a paper on sarcoma occurring in the ischio-rectal fossa or its neighbourhood, gives the following points in differential diagnosis: (1) Abscess: this is generally not difficult, with the exception of Pott's disease or tuberculosis of the bony pelvis. However, an X-ray examination should clear it up. (2) Tumour of the labium majus: careful examination should enable this condition and No. 3 to be distinguished from sarcoma. (3) Perineal hernia. (4) Gumma: an examination for other signs of syphilis and a Wassermann test should clear up the diagnosis. (5) Anal carcinoma: removal of a specimen for biopsy is indicated. (6) Teratoma.

Treatment consists in complete extirpation with post-operative irradiation.

Tuberculous Fistula.—C. L. Martin⁹ discusses the treatment of tuberculous fistulae. Cases were mostly drawn from the Chicago Municipal Tuberculosis Sanatorium: 84 of the patients had pulmonary tuberculosis from a few weeks to thirteen years before the occurrence of the fistula; 13.3 per cent had a fistula before the diagnosis of pulmonary tuberculosis was made. The gelatinous granulation tissue lining the cavities of the tracks was examined microscopically and giant cells and tubercles were looked for. Martin considers this more reliable than examinations of the wall of the track itself.

The anæsthetic used for operation was either chordal block or low spinal anæsthesia. After having tried operating by the cautery as well as the knife, he has come to the conclusion that healing is more satisfactory and the results are better where the fistula is operated on with an ordinary scalpel rather than with a diathermy knife or cautery. This is contrary to the practice of most surgeons at the present day.

The author comes to the following conclusions: (1) Because of the traditional belief that they should not be operated upon, fistulae in tuberculous patients are often neglected. (2) Tuberculosis was proved in 72 per cent of the cases quoted, but he believes that a larger percentage were in fact tuberculous. (3) In 87 per cent of the patients with pulmonary tuberculosis in whom a fistula operation had been performed healing was complete.

Oil-soluble Anæsthetics in the Treatment of Rectal Diseases.—R. V. Gorsch¹⁰ discusses the use of oil-soluble anæsthetics in the treatment of *fissure*, *pruritus ani*, *piles*, and *coccydina*. The object of these oil-soluble anæsthetics is to produce prolonged anæsthesia in the nerves in the neighbourhood in which they are injected, and he favours the use of *anucaine*, which consists of 5 parts each of benzocaine and phenmethylol, 1 part butylaminobenzoate, and one-eighth basic procaine, in sweet almond oil. He points out the fact that these anæsthetics are very slowly absorbed and that the solution must not be pooled in one place and must not be injected into the skin or immediately under it. Contra-indications to their use are the presence of acute abscess or inflammation, fistula or fissure with abscess, strangulated piles or sloughing piles, patients with diabetes, and markedly anæmic individuals. The complications usually met with are sloughing with abscess and various degrees of pain

immediately or soon after the injection. In some cases the pain is quite severe. [Another complication, which must be a rare one, is a temperature and symptoms like those found in an acute attack of influenza. Such cases are probably due to the fact that the individual is susceptible to olive oil. However, in such cases a different base can be used satisfactorily.—J. P. L.-M.]. The author considers that the oil-soluble anaesthetics are much safer and better than quinine urea-hydrochloride. In fissure the injections are made through a puncture about an inch behind the anus into the cellular tissue on either side of the anal canal and lateral to the external sphincter muscle. In cases of pruritus the injections are made into and around the anus, one portion being done at a time in a series of sittings. The amount placed in any one spot should not be more than $2\frac{1}{2}$ c.c., and not more than 8 to 10 c.c. are injected at one sitting. The second injection is given in about a week's time into the parts not already injected. Gorsch also discusses the value of this method in laying open external thrombotic hemorrhoids and in operations for internal hemorrhoids. He also states that he has treated cases of coccydynia successfully by this method by injecting the oil into the neighbourhood of the most painful spot.

Rectal Incontinence.—J. P. Lockhart-Mummery¹¹ discusses the causes and treatment of rectal incontinence. The former are classified as follows: (1) Congenital absence of the sphincter. (2) Damage to the sphincter from operation or injury. (3) Involvement of the external sphincter in fibrous tissue. (4) Loss of sensation of the anal opening due to tabes or other disease of the central nervous system. (5) Retention with overflow. This may occur in elderly patients and in young children. It is often unsuspected, and is, of course, easily put right by clearing the rectum out. (6) Stretching of sphincter muscle from prolapse of the rectum. (7) Damage or tearing of the rectum during labour in women.

Except in cases of disease of the central nervous system, or complete absence of the sphincter, the best treatment is by a carefully planned operation to restore the sphincter into a condition in which it is able to close the opening effectually. Any dense fibrous tissue must be carefully removed, the ends of the muscle must be found, and, after being well freed, brought carefully together without tension. The author prefers to graft the ends of the muscle into each other, or to overlap the ends. Suturing should be done with fine catgut and the whole operation undertaken with the greatest care as regards sepsis. Tension is to be particularly avoided. Any tension on the sutures or secondary sepsis will probably result in failure. The results are good, and although more than one operation may be required to obtain a successful result, complete continence should always be re-established.

Radium Treatment of Epithelioma of the Anus.—R. Bensaude, A. Cain, P. Oury, and A. Poirier¹² quote the results of 20 cases treated at the French Radium Institute between 1921 and 1932. Eight cases which were kept under observation had no recurrence after treatment—1 case was well after 10 years, 3 cases were well after 5 years, 2 cases were well after 2 years, 1 case was well after $1\frac{1}{2}$ years, 1 case was well after 1 year; 8 cases recurred; and 4 cases showed no improvement of the local lesion after treatment.

J. P. Lockhart-Mummery¹³ discusses the treatment of epithelioma of the anus with radium. He believes that better results can be obtained by using radon seeds than radium needles, as the seeds cause less local sepsis and can be placed in position with greater accuracy. The seeds are calculated to be 1.5 mc. strength at the time of insertion and are screened with 0.8 platinum or the equivalent in gold. Before inserting the seeds the tumour is, as far as

possible, cut or scraped away, and the seeds are then inserted into the tissues under and around the tumour at distances of 1 cm. from each other. Removal of the major part of the growth is a great advantage before inserting the radium, especially if the raised edges of the growth can be got rid of. Bleeding as a rule is not troublesome and can be controlled by the cautery or by pressure. Success depends very largely upon accurate placing of the seeds and accurate dosage. Unfortunately there is very little to help the surgeon in arriving at a correct dose in any individual case. As a rule there is no severe reaction, but the patient must be kept quiet until the radium has ceased acting, which will be in about ten days. The seeds are left in place and very seldom cause any trouble. In a successful case the tumour entirely disappears in the course of a few weeks. If glands in the groin are present, they are best treated by excision and subsequent irradiation.

The Operative Treatment of Cancer of the Rectum.—A number of papers have appeared during the year on this subject, but they contain nothing new with the exception of a paper by W. B. Gabriel¹⁴ in which he describes a new modification of the abdomino-perineal operation for removal of growths at the recto-sigmoidal junction. This consists in reversing the steps of the operation by doing the perineal stage before the abdominal one. It is claimed for this technique that there is less shock and that the operation is easier. The abdominal stage is shortened, as the rectum is completely freed from below except for division of the colon and its mesentery: also the closure of the peritoneal floor is facilitated by the fact that the rectum has been removed and has not to be pushed beneath it. Unless an exploratory laparotomy is done previously there is some danger that extensive secondary deposits in the liver or elsewhere will not be detected before removing the bowel.

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RENAL DISEASES. (See also HYPERTENSION; KIDNEY.)

H. L. Tidy, M.D., F.R.C.P.

Renal Efficiency Tests.—E. M. Chapman and J. A. Halsted¹ (Massachusetts) have made a careful study of the *phenolsulphonephthalein* test in nephritis. They gave 600 c.c. of water to drink and after thirty minutes an intravenous injection of 1 c.c. (6 mgrm.) of the dye. Voided specimens of urine were then collected at intervals of 15, 30, 45, 60, and 120 minutes. Estimations of the percentage of dye excreted were made with a Duboseq colorimeter. In the same patient the non-protein nitrogen of the blood was estimated and van Slyke's urea-clearance test was performed. The results were then compared. As compared with normal controls the most definite change was delay in elimination of the dye, especially in the first fifteen-minutes period. (This is in accordance with previous investigations.) Chapman and Halsted consider that the dye test gives the same results as van Slyke's test, but that it is quicker to perform.

T. W. T. Dillon² has studied the results obtained by a modification of van Slyke's urea-clearance test which he refers to as the 'urea-diffusion test'. The test is performed as in van Slyke's method except that 15 grm. of urea are administered at the beginning of the test. This has, of course, been employed previously with the object of compelling the kidney to work at its maximum power. To the results thus obtained is applied a formula devised in Dublin

by Conway on the basis of a new theory of kidney function which differs in several essential particulars from the Cushny theory. The formula is as follows :

$$\sqrt{\frac{\text{Volume in c.c. per hour}}{4}} \times \frac{\text{Urinary urea in grm. per cent}}{\text{Blood-urea in grm. per cent}} = K$$

K is a biological constant with a mean value of 100 and a normal range of variation from 62.5 to 137.5. A correction of 0.5 per kilo must be added to the value obtained for all weights in excess of 80 kilos or below 60 kilos. The correction is added to the figure obtained when the weight of a patient is below 60 kilos, and is subtracted when the weight is above 80 kilos. This test has been applied to 57 cases of essential hypertension, and Dillon believes that it is possible to divide them into two groups—those with normal and those with defective kidney functions.

F. S. Fowweather³ has also studied van Slyke's urea-clearance test with the modification of administering 15 grm. of urea at the commencement. He finds that the blood-urea concentration is not constant for the first hour period after giving urea, but that in the second hour period there was approximate constancy. The clearance values during the second hour after urea were concentrated within a decidedly narrower range than the values obtained without urea. In a series of 50 cases in which there was no evidence of renal disease the value did not fall below 70 in any case, whilst with the similar test without urea it fell below this figure in 13 cases. On applying the test to cases with evidence of renal disease the figure after urea did not reach a normal value in any instance. It would thus appear that the determination of blood-urea clearance after urea is a very valuable method for the investigation of renal function.

A. Cantarow and G. Ricchiuti⁴ have studied the urea-clearance test in pregnancy. In 39 cases of normal pregnancy the urea-clearance values ranged from 28 to 184 per cent of the average normal as established by van Slyke. In individual cases the urea-clearance value, which was normal in the first few months of gestation, diminished as pregnancy progressed, being rather constantly low a few days before the onset of labour. High values were obtained during the early days of the puerperal period. The authors consider that sub-normal clearance values obtained during the last few months of gestation must be interpreted with caution, particularly in the absence of clinical or laboratory evidence of renal dysfunction. They suggest that these findings may be dependent on changes in total metabolism and protein metabolism, foetal development, and alterations in the rate and volume of blood-flow through the kidneys.

E. Matthew and J. D. S. Cameron⁵ (Edinburgh) have studied the value of *Congo-red* as a test in renal conditions. In a normal person following the intravenous injection of *Congo-red* the dye remains in the blood and can be demonstrated there for upwards of ten hours. In amyloid disease it disappears from the blood in two hours, amyloid tissue being a powerful absorbent of *Congo-red*. The authors found that in cases agreeing with the clinical conception of nephrosis the dye disappeared from the blood in two hours and appeared in the urine, this being the only condition in which it can be recognized in the urine. They attribute this appearance in the urine to an altered permeability of the glomerular capsule which they accept as being present in nephrosis. These interesting results require further investigation.

Removal of Septic Foci in Acute Nephritis.—Arnold Osman⁶ (London) discusses the value of removal of septic foci in the treatment of cases of acute nephritis which do not clear up spontaneously within two or three months and yet show no signs of becoming subacute or chronic in the sense in which these terms are usually employed. In seven consecutive cases of this type tonsillectomy was carried out, and in his opinion proved of ultimate benefit in only one.

Osman is strongly of the opinion that tonsillectomy is of very doubtful value as a means of hastening recovery. It will be noted that the number of cases is small and few details are recorded, but it is right that this series should be borne in mind, although it is contrary to the more optimistic results of other observers and the strong evidence that acute nephritis is connected with streptococcal infection.

Treatment of Nephritis.—Professor Arthur Ellis⁷ gives a good review of the treatment of various types of nephritis. He follows the general principles which are now widely adopted. He emphasizes the value of a starvation period at the onset of acute diffuse nephritis. In hypertensive encephalopathy he points out the importance of not performing lumbar puncture before venesection has been done, since in some instances subarachnoid hemorrhage has been known to follow. The removal of all foci of infection is important, such as chronically inflamed tonsils and infected teeth. In nephrotic oedema he has seen no decisive results from the use of salyrgan.

The Importance of Dealing Quantitatively with Water in the Study of Disease.—L. H. Neuburgh and F. H. Lashmet⁸ (Ann Arbor), in an article with this title, refer to their investigations in nephritis. The test diet was composed of food selected for its dryness and without any additional water. By these means the available water was reduced to about 700 c.c. for each twenty-four hours. Under these conditions normal kidneys removed the 32 gm. of solid waste contained in the diet in a relatively small amount of water because the kidneys can form highly concentrated urine. The subjects must dehydrate themselves to do so, since they continue to lose about a litre of water vapour daily even though they drink no water. Cases of chronic nephritis without oedema also rid their bodies of all the solid wastes, but as they cannot secrete a concentrated urine they have to pass two or three times as much water as the normal to prevent retention. The normal cases pass about 450 c.c. of urine daily and the chronic nephritics about 900 c.c., the far advanced cases passing as much as 1400 c.c. Cases of nephritis with oedema gave a totally different response. The volume of the urine is small (in comparison with the specific gravity) and a marked retention of urinary solids takes place. The authors form the conclusion that even the cases with oedema should be given large amounts of water.

Lipoid Nephrosis and its Relation to Glomerulonephritis.—E. G. Pannick⁹ (Rochester, Minn.), has made a careful study of 160 patients more than fifteen years of age who presented the nephrotic syndrome at the Mayo Clinic. In 111 cases glomerulonephritis was definitely advanced, and these cases are not further referred to, but the author states that most of them have subsequently died in uræmia. Nineteen cases are classified as 'mixed nephrosis', since evidence of glomerulonephritis was already present. The remaining 30 cases justified a clinical diagnosis of lipoid nephrosis on their first admission. These cases have been carefully investigated. The author notes that, as a group, these patients have ultimately done surprisingly well, much better than a similar group of patients with chronic glomerulonephritis would have done, although in children the prognosis is apparently not so good. But it was found that in 7 of these cases subsequent examination showed the development of definite chronic glomerulonephritis, and 4 patients died in uræmia. He argues that if glomerulonephritis can be proved to have developed in 7 of 30 cases of lipoid nephrosis there must be some intimate relationship between the two diseases, this incidence being too high to be explained on a purely accidental basis. The fact that not a single case typical of lipoid nephrosis in an adult has come to post-mortem examination at the Mayo Clinic suggests that at least most cases of lipoid nephrosis represent a stage in or an unusual type of glomerulonephrosis, but the relatively high percentage of patients who have

been cured of lipid nephrosis, or who have shown vast and prolonged improvement, and the relatively slight evidence of glomerulonephritis in most cases at post-mortem examination, even among patients who have given clinical evidence of glomerulonephritis, justify the clinical grouping of these cases separate from those of ordinary glomerulonephritis. Consequently, there seems to be no good reason for changing the term 'lipid nephrosis' as applied to these groups.

Effect of Diathermy Treatment of Kidneys on Renal Function.—I. H. Page¹⁰ (New York) has studied this subject. The use of this treatment has been based on the theory that Bright's disease results from spasm of the renal vessels, it being asserted that the diathermy current actually heats the kidney and thus causes relaxation of the arteriolar spasm, in turn resulting in better perfusion of the kidney with blood. Page treated a series of cases with one-hour periods of diathermy and noted the effect on the urea-clearance test. The subjects were either normal or those suffering from acute hæmorrhagic nephritis, nephrosis, or essential hypertension. No significant change was observed in the blood-pressure or in the renal functions as measured by the urea-clearance test, diuresis, or blood-urea. The author concludes that the results afford no support for the assumption that renal diathermy is of therapeutic value in essential hypertension or Bright's disease.

Œdema in Nephritis.—J. B. Rennie¹¹ (Glasgow) publishes an important and careful study of œdema in nephritis. This is specially directed to the question of what part the osmotic pressure of the serum protein plays in the production of œdema in acute nephritis. He points out that it is generally held that it is impossible to include the œdema of acute nephritis within Starling's theory of pathogenesis, since it may occur with serum protein little if at all below normal level. Some fall in the serum protein is customary, and Peters has suggested that capillary permeability is increased and that some protein escapes through the capillary wall and thus exerts osmotic pressure in the wrong direction. Rennie has carefully measured the serum protein in 63 cases of acute nephritis, together with 20 apparently normal children, 3 cases of cardiac failure with œdema, 2 cases of nutritional œdema, and 4 cases showing the nephrotic syndrome. His results are recorded in the following table:—

SERUM PROTEINS IN VARIOUS TYPES OF ŒDEMA.

	NO. OF CASES	AVERAGE TOTAL PROTEIN	AVERAGE ALBUMIN	AVERAGE GLOBULIN	CALCULATED OSMOTIC PRESSURE	NUMBER OF OBSERVA- TIONS
		Grm. per cent	Grm. per cent	Grm. per cent	mm. Hg	
Normals	20	7.42	5.02	2.39	30.90	20
Cardiac failure	3	6.36	3.08	3.28	22.30	3
Nutritional œdema ..	2	4.11	2.76	1.35	17.10	3
Nephrotic syndrome ..	4	4.60	2.38	2.24	16.20	32
Acute nephritis	63	6.65	3.99	2.63	25.60	63
Level at which œdema usually occurs (Peters and others*)	—	5.00	2.50	—	14.21	—

* *Medical Annual*, 1917, 1922, 1929.

The serum osmotic pressure has been calculated from Govaert's formula as follows:—

$$(5.5 \times \text{albumin in grm. per cent}) + (1.4 \times \text{globulin in grm. per cent}) \\ = \text{serum osmotic pressure in mm. Hg.}$$

These results are in general agreement with previous observations. The author has also carefully measured the blood-pressure in acute nephritis and correlated it with the variations in oedema and in the serum protein. He rejects Peters' theory of capillary permeability on the grounds that globulin would escape as well as albumin, which does not occur. [It may be doubted if this is a conclusive argument in view of the different sizes of the molecules.—H. L. T.] He finds that a marked fall in serum osmotic pressure may occur early in the onset of acute nephritis. He concludes that there is evidence to show that oedema in acute nephritis is not due to increased capillary permeability, nor in the majority of cases to the fall in serum osmotic pressure *per se*, but that there is evidence to show that the rise in blood-pressure and fall in serum osmotic pressure may be jointly responsible for the development of oedema. The early and gross reduction of serum osmotic pressure in certain cases of acute nephritis is against the view that a diminution of serum protein is entirely due to albuminuria. He suggests that defective synthesis of serum protein is the immediate factor.

Plasma-cholesterol in Nephritis.—J. Maxwell¹² (London) contributes a further note on plasma-cholesterol in nephritis, describing the subsequent progress of a series of cases investigated six years previously. He concludes that in the acute stages the plasma-cholesterol is roughly proportional to the degree of oedema, but that the chemical tests add nothing to the prognosis which would be based on the clinical progress. In the more chronic types of renal disease the plasma-cholesterol varies within very wide limits and no relations can be demonstrated with the clinical course.

Nephritis in Dogs.—Professor Tom Hare¹³ communicated to the Section of Comparative Medicine at the Royal Society of Medicine an interesting study on the pathology of nephritis in the dog. It would appear that the pathology is comparable to that in the human being. Acute nephritis is rare, but chronic nephritis is much commoner, and Professor Hare has collected the records of nearly 150 cases in nine years.

Renal Functions in Persons with One Kidney.—L. B. Ellis and Soma Weiss¹⁴ (Harvard) have studied this subject. In their series of 12 cases 9 of the patients were quite healthy, 2 had pyonephrosis of the remaining kidney, and 1 had hypertension. They conclude that in the absence of complications the renal function of persons with one kidney is not only adequate but possesses a reserve capacity as well.

Lead in Etiology of Chronic Nephritis.—K. D. Fairley¹⁵ has reviewed fully the evidence relating to lead as an etiological agent in chronic nephritis in Queensland. It will be remembered that some time ago the frequency of chronic nephritis among children in Queensland was noted and also the frequency of lead poisoning. Queensland is a very hot dry country, and the association was attributed to the weathering of lead paint on wooden buildings which subsequently washed off when heavy tropical rain occurred. Fairley's report strongly upholds these views. [It is somewhat striking that this mortality from Queensland should have continued for many years before being observed.—H. L. T.]

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1933, Aug., 224; ²*Irish Jour. Med. Sci.* 1933, Nov., 620; ³*Quart. Jour. Med.* 1934, Jan., 63; ⁴*Arch. of Internal Med.* 1933, Oct., 637; ⁵*Edin. Med. Jour.* 1933, Dec., 569; ⁶*Guy's Hosp. Rep.* 1933, Oct., 507; ⁷*Lancet*, 1934, Feb. 17, 333; ⁸*Amer. Jour. Med. Sci.* 1933, Oct., 460; ⁹*Jour. Amer. Med. Assoc.* 1934, Jan. 20, 172; ¹⁰*Ibid.* April 7, 1131; ¹¹*Quart. Jour. Med.* 1933, Oct., 521; ¹²*Ibid.* 1934, Jan., 79; ¹³*Proc. Roy. Soc. Med.* 1934, May, 789; ¹⁴*Amer. Jour. Med. Sci.* 1933, Aug., 242; ¹⁵*Med. Jour. of Australia*, 1934, May, 600.

RETENTION OF URINE. (See BLADDER, SURGERY OF.)

RETINA, DETACHMENT OF. *Sir Stewart Duke-Elder, M.D., F.R.C.S.*

Results of the Various Methods of Operative Treatment.—The greatest interest in the literature of this condition during the past year has been the publication of the results of the various methods of operation. It will be remembered from the reviews of the four previous years that three different techniques have been proposed for establishing reposition of the retina: cautery puncture (Gonin), the application of chemical caustics to the choroid through trephine holes in the sclera (Guist and Lindner), and diathermy—either as surface diathermy (Larssen) or by puncturing the globe by a diathermy needle (Safar, Weve). The most comprehensive analysis of results comes from London (C. D. Shapland¹) and Vienna (L. Kleiner²).

Shapland's paper, which records the results obtained at Moorfields Hospital, deals with 425 cases of simple detachments operated on between December, 1929, and January, 1933.

Of these, 221 cases were treated by *cautery puncture*, and this figure included 17 cases in which no retinal hole was found and in which a 'blind' operation was performed. The results were as shown in *Table I*:—

Table I.—RESULTS OF CAUTERY PUNCTURE.

	HOLES PRESENT (204 CASES)				'BLIND' OPERATION (17 CASES)			
	No.	Cure	Improved	Failure	No.	Cure	Improved	Failure
Emmetropia	71	24 (33·8)	11 (15·5)	36 (50·7)	4	0	1 (25)	3 (75)
Myopia (0-5D)	40	12 (30·0)	4 (10·0)	24 (60·0)	1	0	0	1 (100)
Myopia (5-10D)	44	16 (36·4)	4 (9·1)	24 (54·5)	3	0	0	3 (100)
Myopia (over 10D)	41	8 (19·5)	1 (2·4)	32 (78·1)	6	0	1 (16·7)	5 (83·3)
Aphakia	8	1 (12·5)	1 (12·5)	6 (75·0)	3	0	0	3 (100)

Table II, indicating the effect of the duration of the detachment, is interesting as showing the value of early treatment.

Table II.—SHOWING VALUE OF EARLY TREATMENT IN DETACHMENT OF RETINA.

DURATION OF DETACHMENT	CURE
Under 6 weeks	40
6 weeks-3 months	28
3-6 months	22
Over 6 months	10

Complications of cautery puncture, apart from the production of secondary rents and vitreous hæmorrhage, were few. Thus, in the 221 cases so operated upon, 39 (17·6 per cent) showed secondary holes, and 16 (7·2 per cent) a complete vitreous hæmorrhage. There were three examples of traumatic cataract, three of a diffuse sub-retinal hæmorrhage, in one of which the development of a large opaque brownish mass beneath the retina suggested the diagnosis of thrombosis of a vorticos vein, whilst in one case the cautery point fused and was left in the patient's retina, where it produced a remarkable ophthalmoscopic picture. In addition, ten cases showed a transient uveitis characterized by slight chemosis of the ocular conjunctiva, ciliary injection, keratic precipitates, cells in the anterior chamber, retraction of the iris, and hypotonia. The majority of these cleared up in the course of a few days on atropine and hot

bathings; in fact, two of the cases having this complication were ultimately discharged from hospital cured, so it does not necessarily militate against a successful result; on the other hand, in one case it led to seclusion of the pupil, iris bombé, and secondary glaucoma for which an iridectomy had to be performed five months later. In two cases in which operation was followed by a complete vitreous hæmorrhage, in one of which a traumatic detachment was complicated by subluxation of the lens, and in one case where the affected eye received a severe blow fifteen months after cautery puncture, secondary glaucoma supervened, the eyes became blind and painful, and excision had to be performed.

Secondary rents, by which term is meant fresh defects in the retina following upon, and apparently a direct result of, the operative procedure, are of three types:—

1. Irregular rents at the site of the cautery scar, due either to a further tearing of the retina in the neighbourhood of the original hole by the trauma of the operation or to a condition which Lindner alleges is allied to necrosis produced by the thermo-cautery in the adjoining part of the retina.

2. Traction rents, which may be of two varieties: (a) Holes, usually of an irregular shape, but occasionally assuming an arrow-head form, and characteristically situated at a point more or less diametrically opposite the site of cautery puncture, which are apparently due to coagulation and contraction of the vitreous towards the scar with a consequent pull on the retina. (b) Dialyses in the neighbourhood of the operation scar, which seem to be produced by a mal-reposition and shortening of the retina which again results in traction towards the cicatrix.

3. The extension of an anterior retinal dialysis. In a small proportion of the cases operated upon for this type of rent, the retina continued to tear away from the region of the ora serrata in the neighbourhood of the cautery scar. The mechanism would again appear to be imperfect re-application, shortening of the retina, with consequent traction towards the cicatrix.

Seventy-nine cases were operated on by *chemical cauterization of the choroid*; in 57 of these retinal holes were found, and in 22 these were not seen and a 'blind' operation was done. The results were as shown in *Table III*.

Table III.—RESULTS OF MULTIPLE TREPHINING AND CAUSTICS.

	HOLES PRESENT (57 CASES)				'BLIND' (22 CASES)			
	No.	Cure	Improved	Failure	No.	Cure	Improved	Failure
Emmetropia ..	16	7 (43·8)	3 (18·7)	6 (37·5)	4	2	1	1
Myopia (0-5D) ..	12	1 (8·3)	3 (25·0)	8 (66·7)	2	1	0	1
Myopia (5-10D) ..	12	4 (33·3)	1 (8·3)	7 (58·3)	7	1	0	6
Myopia (over 10D)	15	2 (13·3)	0	13 (86·7)	7	1	2	4
Aphakia ..	2	1 (50·0)	1 (50·0)	0	2	0	1	1

Seventy-two cases were operated on by *surface diathermy*, with the results shown in *Table IV*.

Complications following this type of operative treatment have been notably small in number. In no case was there any marked increase of vitreous opacities attributable to the operation, nor was there any extensive vitreous hæmorrhage, though small sub-retinal and intra-choroidal extravasations of blood were occasionally seen. There were five (6·9 per cent) examples of secondary holes, two of a transient uveitis, and one example of a localized choroidal infarct. Thrombosis of a vortex vein did not occur.

Table IV. RESULTS OF DIATHERMY.

	HOLES PRESENT (60 CASES)				'BLIND' OPERATION (12 CASES)			
	No.	Cure	Improved	Failure	No.	Cure	Improved	Failure
Emmetropia ..	21	11 (52.4)	1 (4.8)	9 (42.8)	1	1	0	0
Myopia (0-5D) ..	21	12 (57.2)	5 (23.8)	4 (19.0)	1	1	0	0
Myopia (5-10D) ..	7	4 (57.1)	1 (14.3)	2 (28.6)	4	0	0	4
Myopia (over 10D)	10	4 (40.0)	2 (20.0)	4 (40.0)	3	1	0	2
Aphakia ..	1	0	0	1	3	0	1	2

Table V.—RESULTS AND COMPLICATIONS IN CAUTERY PUNCTURE, MULTIPLE TREPHINING, AND DIATHERMY.

	RESULTS		CHIEF COMPLICATIONS			
	Cure	Improved	Secondary Holes	Vitreous Hemorrhages	Uveitis	Thrombosis of Vortex Vein
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
<i>Cautery Puncture</i> —						
Holes present ..	29.9	10.3	17.6	7.2	4.5	0.45
'Blind' operation ..	0	11.8				
<i>Multiple Trephining</i> —						
Holes present ..	26.3	14.2	11.4	7.6	2.5	2.5
'Blind' operation ..	22.7	18.2				
<i>Diathermy</i> —						
Holes present ..	51.7	15.0	6.9	0	2.8	0
'Blind' operation ..	25.0	8.3				

In Table V are shown the results obtained in all cases operated upon by cautery puncture, multiple trephining, and diathermy, together with the chief complications observed, all figures being expressed as percentages.

From these results there would appear to be no doubt that the method of diathermy, in addition to being the easiest technically, is the most satisfactory method devised for the treatment of this condition.

Visual Results.—The field is apparently restored rapidly on the retina becoming replaced, for the great majority of cases in which the retina was *in situ* ten to fourteen days after operation have given a full field to a one or a half degree white object at a third of a metre, at the most there being only a small loss corresponding to the site of operation. A full field was obtained in a case successfully treated and having a history of two years' duration, but in one in which the detachment had been present for six and a half years, and was cured by operation, no improvement in visual field resulted. The improvement in central vision has been variable. If the macula has not been involved in the detachment, visual acuity is unaltered by the operation unless, on account of vitreous opacity, a line or so less on Snellen's type may be read for a while, but, on the vitreous clearing, a process which varies with the amount of opacity and takes usually some two to three months, central vision returns to normal. If the macula has been involved in the detachment and the case has been successfully treated, central vision on the patient's discharge from hospital is usually 6/36 to 6/24 partly. In these cases there seems to be no question that a gradual improvement in central vision occasionally occurs over and above that merely dependent upon a clearing of the transparent media, for isolated examples have occurred in this series of a restoration of visual acuity to 6/9 and even 6/6 Snellen when there has been no doubt concerning the previous implication of the macula in the detachment.

Kleiner's statistics are not so extensive, and relate to the two earlier types of operation only. They are given in *Tables VI, VII*.

Table VI.—RESULTS OF GONIN'S THERMO-PUNCTURE.

NUMBER OF CASES	AGE OF DETACHMENT	CURES
39	Up to two months ..	15 (38.4%)
21	Two months to one year	6 (28.6%)
5	Over one year	2 (40.0%)

Table VII.—RESULTS OF GUIST'S CHEMICAL CAUTERIZATION.

NUMBER OF CASES	AGE OF DETACHMENT	CURES
34	Up to two months ..	19 (55.8%)
15	Two months to one year	9 (60.0%)
5	Over one year	4 (80.0%)

In a further contribution from Vienna, L. Sallmann and K. Sveinsson³ report a study on the visual acuity and fields after operation for detachment—information of which we stand badly in need. They collected 101 cases from Lindner's clinic successfully treated (i.e., with complete re-attachment of the retina) by the methods of Gonin, Guist, and Lindner, and analysed them according to the duration of the disease and, as a basis of subdivision, the vision immediately preceding operation.

As regards the central vision after successful operation, the authors show that while improvement depends chiefly on the duration of the disease, operation should be given a trial even in detachments of one to one and a half years' standing, because in a large percentage of these cases useful vision can be obtained. Apart from the factor of duration, the prognosis for the vision is, as a rule, more favourable if, prior to operation, it has not sunk below the counting of fingers.

The size and character of the detachment, as well as the age of the patient, have no appreciable influence on the vision of these successful cases; nor has the position of the tears (or the site of the operation), apart from tears at the macula. The number of operations necessary to effect a cure can have an unfavourable influence on the vision if the operation has to be repeated more than three times. In cases of tears at the macula the prognosis after operations with caustic potash is not so unfavourable as might be at first supposed. None of the operative procedures here considered carries with it any risk as regards the non-improvement of central vision after operation.

The cases treated with caustic cauterization did not show any changes at the macula that could be regarded as a remote effect of the action of the caustic substance. After ignipuncture a remote reaction could not be definitely excluded in individual cases. Certain changes at the macula are associated with the use of caustic, but they are of no practical importance as they do no damage to the vision. Other macular changes are perhaps due to mechanical injury at the operation.

Dense vitreous opacities, causing low central vision, are most frequent after ignipuncture, and occur most seldom after the undermining operation to be noted later.

The vision obtained shortly after operation may further improve appreciably as time goes on through gradual recovery of the retina. Investigations on the visual field show that after re-attachment of the retina it increases usually considerably and continues to do so, more rapidly and more fully in recent cases than in those of long standing. As to colour vision, the perception for red returns first, followed by that for blue, earlier in recent cases than in old. In detachments of less than one year's standing the field for blue usually increases considerably, so that the physiological arrangement of the colour fields is ultimately attained. In old detachments the limit for blue remains smaller than that for red; in them blue is at first called green. The later improvement in the field may continue for years. In contrast to the duration of the disease, the age of the patient and the character of the detachment appear to have no influence on the recovery of the field, nor can too much importance be attached to the extent of the detachment.

While none of the operations offers any special advantage for improvement in the central vision, ignipuncture is less favourable as regards increase of the fields than the other methods, as with it considerable defects in the fields occur most frequently. Numerous repetitions of the trephine method cause an amount of damage that is not explained by the extent of the operation.

The cases treated by the newer diathermy method were not included with the others, because the number was too small and the period under observation too short; as regards visual acuity and field, however, the results from this operation were not materially different from those obtained by other methods.

New Technique.—So far as new technique is concerned, some revolutionary ideas have been put forward during the last year. Minor improvements on those already described have been suggested, such as C. B. Walker's⁴ modification of Safar's diathermic method (MEDICAL ANNUAL, 1934, p. 403). Walker uses *separate detachable micropuncture pins* made of iridium-hardened platinum which are made to penetrate the sclera until they are held up by small non-insulated stops. Several of these are inserted into the globe around the detached area. The advantages claimed for this method are that the sclera gets a surface coagulation from the circular stops (Larsen effect) as well as the diathermy puncture, and that the mouth of the outlet is thus widened, allowing better drainage, while the pins are more easily removed from the eye than Safar's 'brushes'.

K. Lindner⁵ has suggested a new method of dealing with a detachment involving a hole near the macula. An incision in the sclera is made, usually above the insertion of the inferior oblique muscle, and the choroid is undermined by a spatula inserted through this incision. Thereupon a weak solution of caustic potash is injected between the choroid and sclera; finally, peripheral tears are blocked off with diathermy. Lindner gives the results of 9 cases so treated, and finds this '*undermining*' method to be very satisfactory in this type of case. It is interesting that secondary changes as seen ophthalmoscopically are slight, and the average recovery of vision is good. One case, for example, wherein the undermining operation was done twice on the same eye, obtained a corrected vision of 6/36.

An entirely new suggestion has been made by Rubbrecht,⁶ who produces the necessary adhesions between the sclera and choroid and retina by means of *silk sutures passed through these tissues*. He suggests that in this way an inflammation is set up in which the proliferative factor is dominant and the exudative factor negligible. He has treated two cases thus with complete success and no harmful reaction, using 00 silk thread; in each case two sutures were inserted, entering at the edge of the detachment and coming out through the area of the centre of the detachment.

The most heroic procedure so far suggested is reported by K. Lindner.⁷ In cases with a bad prognosis, when adhesions exist between retinal folds, or where bands of scar tissue are adherent to the retina, whether post-operative complications or not, he *excises large strips of sclera* parallel with the equator of the globe, suturing the lips of the scleral wound with sutures running through the thickness of the cut scleral surfaces. Four such strips are taken out, one in each quadrant, with the result that the antero-posterior diameter of the eyeball is shortened, and any myopia is incidentally reduced.

A new and further technique for the treatment of detachment has lately been suggested. At the meeting of the Swiss Ophthalmological Society, on May 4, 1934, A. Vogt⁸ reported for the first time on his new method of 'catholysis'. The apparatus generally used for electrolysis of the lashes can be employed. The anode is placed on the surface of the eye; the cathode is a very fine needle. After removal of the conjunctiva the spot is marked on the sclera with Indian ink. The needle cathode is passed through the sclera, deep enough to reach the detached retina, a galvanic current of 0.5 to 1 milliampere being used. The application is very short, and the hole and its boundaries must be touched. The method in Vogt's own words shows the following advantages in comparison with the others:—

"1. Catholysis does the least damage. Cauterization produces temperatures of 500° C. to 1000° C., caustic potash destroys the tissue to an uncontrollable extent, diathermy with 50 to 100 milliamperes causes burns. The diathermic needle also pierces the detached retina in a dangerous and useless manner. The catholysis, on the contrary, introduces only very small quantities of energy into the eye (0.5 to 1 milliamperes). Thus the method is the most adequate to treat the delicate retina.

"2. The other methods often produced scar membranes and secondary holes, opacities of the lens, optic neuritis. Late hæmorrhages sometimes have occurred. These complications have never arisen after the new operation.

"3. Only very small quantities of the vitreous are lost, even when the sclera is punctured frequently at one operation, which therefore need not be interrupted.

"4. The needle can be passed into the eye as often as we want without danger, provided that only 0.5 to 1 milliampere is used and that the application lasts less than a second each time. Very large holes and multiple holes can, therefore, be treated in one operation. Exact dosage is possible.

"5. The method was introduced by Vogt primarily because the cathode produces bubbles of hydrogen in the eye, at its point as well as along its whole length. These bubbles can easily be seen with the ophthalmoscope and allow determination of the topographical relations between the hole and the first puncture during the operation. We are able to make a preliminary puncture for orientation, and after ophthalmoscopic control and correction of the puncture position on the sclera, to close the hole with a series of 5 to 20 or more punctures.

"6. The method is very simple, harmless and painless. The scars are much more delicate than those following other methods. The operation can be finished in 5 to 10 minutes, provided that the eye is prepared the day before and that care is taken to have a perfectly transparent cornea before and during the operation.

"7. The results of the new method have been, up to the present, excellent. It was successful in cases of very old detachment, of very large holes, and even in aged patients."

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RHEUMATIC DISORDERS, CHRONIC. *Ivor J. Davies, M.D., F.R.C.P.*

C. W. Buckley¹ (Buxton) in a British Medical Association lecture discusses the causes and treatment of rheumatoid arthritis. The present state of our knowledge of the rôle of infection, vaccine therapy, chrysotherapy (gold salts, etc.) is well described, and in clinical form specially intended for practitioners. References are made to all the important recent contributions in Great Britain and abroad.

R. A. Kinsella² (St. Louis) writes on the types of chronic rheumatism, and finds that there are two main types: the one known as rheumatoid arthritis, of apparently infectious nature, caused by some as yet undiscovered agent and without successful treatment at the present time; the other, known as degenerative arthritis, in which the factors of production are fairly well recognized and in which subsequent injury or superimposed focal infection constitute the reasons for bringing such persons under medical care. In this second disease recovery is much more likely to occur.

B. H. Archer³ (New York) has studied a very large series of chronic non-specific arthritis observed over ten years. A comprehensive review of the subject is made. The following conclusions are drawn:—

1. There appears to be a basis for the concept that both rheumatoid arthritis and osteo-arthritis are due to the same etiological agent or group of agents and that the proliferative and degenerative pathological changes by which the two types manifest themselves are the result of other factors than those of causation.

2. There seems to be no conclusive evidence of the presence of streptococci in the blood and joints of patients with chronic arthritis.

3. None of the vaccines employed at the present time in the treatment of chronic arthritis have been accepted by the Council on Pharmacy and Chemistry. There is no evidence at hand that they exercise any specific effect on the course of the disease.

4. Dietary regulations and vitamin therapy apparently exercise no specific effect on the joint manifestations of patients with this disease.

5. In those cases associated with foci of infection it seems wise to search for and remove this factor early in the course of the disease.

6. In advanced cases the measures he has found to be of greatest benefit to the patient are orthopedic procedures, physical therapy, the administration of drugs to allay pain, and a change of climate.

7. Present knowledge of the subject does not seem to warrant the view that certain definite measures should be applied only to certain definite types of arthritis. There is no conclusive evidence that the same measures do not apply at some time to all forms of non-specific arthritis.

Bacteriology.—J. E. Blair and F. A. Hallman⁴ (New York) have made a bacteriological study of rheumatoid (atrophic) arthritis. In a series of cultures of synovial fluids and tissues about 25 per cent yield positive results. The micro-organisms obtained included streptococci, diphtheroid bacilli, Gram-positive cocci alone or with a Gram-negative bacillus. In a control series from a variety of infectious and non-infectious joint conditions other than rheumatoid arthritis, about 20 per cent were positive. The positive cultures included *Staphylococcus aureus*, indifferent streptococci, Gram-positive cocci incapable of subculture, and diphtheroid bacilli. No direct etiological significance was attached to any of the organisms obtained in this series. It is felt that at the present time no specific organism may be considered to have been demonstrated as the etiological cause of rheumatoid arthritis, particularly in view of the multiplicity of results and the lack of general conformation of any one report. A critical review of the results obtained by other investigators is given in this report.

Focal Sepsis in Chronic Arthritis.—R. L. Haden⁵ (Cleveland, Ohio) has studied the rôle of focal infection in chronic arthritis. The clinical and laboratory evidence suggests that infection is a necessary factor in chronic atrophic (rheumatoid) arthritis, but that no one organism is responsible for the disease. Many factors other than infection enter into the clinical picture and determine whether a given individual with the primary infection develops clinical arthritis. Focal infection plays only a secondary rôle in accelerating the degenerative process in chronic hypertrophic arthritis (osteo-arthritis). Such infections should be removed on general principles just as in other degenerative diseases.

Relationship between Anatomical Changes in the Knee-joint with Advancing Age and Degenerative Arthritis.—C. S. Keefer, F. Parker, W. K. Myers, and R. L. Irwin⁶ (Boston) made a systematic study to ascertain this relationship. From the examination of 100 knee-joints of 77 consecutive patients who died from various diseases, the following facts were determined:—

1. Anatomical changes were noted with increasing frequency with advancing age.

2. The patella showed alterations in 81 per cent of the cases, the interpatellar groove in 65 per cent, the lateral condyle of the tibia in 64 per cent, the medial condyle of the tibia in 55 per cent, the medial condyle of the femur in 43 per cent, and the lateral condyle in 36 per cent.

3. The erosions were commonest over the areas of contact which were subjected to the greatest movement, strain, weight-bearing, and injury.

4. The changes were identical in males and females, and there was no relationship between the extent of the lesions in the joints and the symptoms referable to the joints.

5. There was no correlation between the lesions in the joints and the degree of arteriosclerosis or any other particular type of disease process.

6. The gross anatomical changes were indistinguishable from those previously described in degenerative arthritis.

7. The various factors which are of importance in the development of degenerative arthritis are discussed. They include the ageing of tissue, wear and tear, strain, trauma, occupation, and static deformities.

These authors also review previous observations that have been made on the knee and other joints of patients who were not considered to be suffering from arthritis.

Hypertrophic Arthritis of the Hip.—J. G. Kuhns⁷ (Boston) publishes a review of a large series of cases of this condition. Other articulations and tissues showed changes on more complete examination. A study of the histories of the patients in this series suggested the interaction of both local and systemic etiological factors, such as trauma, faulty posture, disordered intestinal function, infections, and endocrine disturbances. Data of the end-results showed that progressive deterioration was not necessarily the usual course, even in the aged, when therapy and supervision were continued for a long period of time. Treatment which changed steadily with the increase in knowledge of this condition was able to relieve the pain and disability in the majority of these patients.

Influence of Jaundice on Arthritis.—N. Sidel and M. I. Abrams⁸ (Boston) write a report of four patients with infectious (rheumatoid or atrophic) arthritis who experienced striking relief of all joint symptoms with the onset of jaundice. Marked relief of the joint pain occurred suddenly with the onset of jaundice in each case. The arthritic pain either remained absent or recurred with much lessened severity with the subsidence of the jaundice. The abnormal factors

present in the jaundiced state are being investigated as to their therapeutic effect in infectious arthritis. *Bile-salts* administration in several cases of infectious arthritis has been attended with clinical improvement.

TREATMENT.

Vaccine Therapy.—The report of the second conference on rheumatic diseases held under the authority of the American Committee for the Control of Rheumatism⁹ should be carefully studied. The subjects discussed were: degenerative (hypertrophic) arthritis; joint tissue changes in chronic atrophic (rheumatoid) arthritis; the physiology of normal joints as related to rheumatoid arthritis; studies on rheumatoid arthritis.

M. Wetherby (Minneapolis) reported favourable results from *streptococcus autogenous vaccines* in 1500 cases of chronic arthritis. Based on Clawson's experimental work on animals, he does not believe that subcutaneous or intramuscular vaccination is comparable with that of the intravenous route.

C. L. Short, L. Dienes, and W. Bauer¹⁰ (Boston) made a clinical study of *autogenous vaccines* in rheumatoid arthritis. J. A. Freiberg,¹¹ F. Klinge,¹² and others, have demonstrated that arthritic changes ensue if an antigen is injected into a previously sensitized animal's knee-joint. They have interpreted these changes as evidence of an allergic arthritis. They described the method employed in identifying the organism which represented the offending antigen as well as the manner of preparation and administration of the desensitizing vaccine. The investigation of the first-named authors was done in an attempt to evaluate critically the soundness of the method of determining a patient's susceptibility to autogenous vaccines. In all, 102 vaccines, obtained from bacteria isolated from 34 patients, were examined: 408 skin tests were made with these vaccines. They concluded that skin tests made with bacterial strains isolated from arthritic patients did not enable them to select specific strains for vaccine therapy. They further held that the different methods recommended for the selection of specific vaccine strains are without a solid theoretical or experimental foundation. The hypothesis that rheumatoid arthritis is a disease of allergic origin is not supported by the conclusions drawn from the interpretation of uncontrolled skin reactions with autogenous vaccines.

Physical Treatment.—L. C. R. L'Estrange Orme¹³ (Matlock) has written a practical article on the physical treatment of chronic rheumatism which will well repay the close attention of practitioners. The elementary physical principles underlying the usual methods of treatment are clearly explained. The following summary is drawn from his paper. The physical treatment of arthritis and of those forms of neuritis and fibrositis which come under the layman's description of 'rheumatics' consists in: (1) Maintaining and increasing the range of movement of joints and preventing fixation, mainly by massage; (2) Improving the local circulation, usually by some form of heat; (3) Improving the general circulatory tonus and improving skin action by stimulant baths; (4) Correcting any static deformity and giving support, if necessary, by mechanical means; (5) Improving the general health by a suitable diet and by encouraging as much exercise as is possible.

R. Kovacs¹⁴ (New York) states that physical measures are an invaluable aid in the constitutional treatment of chronic arthritis and are the mainstay of local treatment for relief of pain and stiffness. No institutional plan of treatment can be considered complete unless it provides for a large range of physical measures under skilled medical direction. There is rarely a patient in whom properly selected and applied physical measures would not bring some immediate relief enabling him to carry on much easier with whatever other form of therapy is indicated. The most important forms of physical

therapy are heat, general and local, from radiant or high-frequency sources or through the medium of water. Heliotherapy—natural and artificial—the galvanic and static current, massage, and exercise. A complete physical therapy service demands special experience and equipment and a skilled staff. Simpler routine measures may be carried on in the home in selected cases. The various measures of physical therapy in chronic arthritis are fully described in this paper.

X-ray Therapy.—S. G. Scott and F. Hernaman Johnson¹⁵ (London) report favourable results from the use of X rays in the treatment of osteo-arthritis. The beneficial results so far obtained in osteo-arthritis and other types of arthritis make it imperative that further work should be carried out on the subject. The correct dosage for each individual case and definite line of technique have to be found.

Sulphur Treatment.—S. C. Woldenberg¹⁶ (New York) reports his results of colloidal sulphur therapy in the treatment of arthritis. The favourable results in this report of 100 cases certainly warrant further investigation and study. The more beneficial results appear to have been obtained in the atrophic type of arthritis. The cystin test has shown that arthritic patients are deficient in sulphur, and that this may be restored by intravenous sulphur medication. This author's studies point to the restoration of metabolic stability as a necessary aim in the treatment of arthritic cases. Recent researches, in showing the important part played by the colloids in all body mechanisms, point the way to therapeutic methods that would directly influence them.

Novalgin.—Dorothy G. E. Potter¹⁷ (Harrogate) reports that novalgin, a pyrazolon derivative, has certain definite advantages as compared with salicylates, particularly in the afebrile types of osteo-arthritis, also in rheumatoid arthritis with occasional slight pyrexia and where the joints "vary with the weather". In her experience novalgin has never been the cause of cardiac irregularity, palpitations, or discomfort. People who complain of heartburn or indigestion after aspirin can absorb novalgin with impunity. In many cases it is more effective dose for dose than sodium salicylate, and it also has the advantage of use as an injection in ampoules containing 50 per cent solution as an analgesic.

Kiuma.—J. L. Kendall¹⁸ (New York) has had good results in the use of kiuma in the symptomatic relief of the arthritides. He quotes from a paper by Watson and Alfred-Brown¹⁹ (Bath), who found that the beneficial effects of radiant heat and other local measures of treatment were much enhanced by the application of this ointment. The active ingredients of the preparation are salicylic acid ester dihydroxethane, oil of *Bassia Parkii*, a type of shea butter, and a small percentage of oil of *Eucalyptus globulus* and cetaceum. The butter is a fatty substance obtained from the nuts of *Bassia Parkii*, and has a long empirical history among the natives of tropical Africa for use in the rheumatoid affections so prevalent in the swampy districts of the African coastal area. The favourable case-reports certainly suggest rather more than a mere analgesic action.

Gold.—G. Slot and P. M. Deville, with collaborators²⁰ (London), record the result of treatment in arthritis and rheumatism with gold. They conclude that in acute and subacute rheumatism in children aurotherapy is of no great value, except possibly in a type of case of subacute rheumatism which they describe. Its use is contra-indicated when severe carditis is present. In rheumatoid arthritis the results of gold therapy are superior to those of other methods, and in their opinion it is a distinct advance in the treatment of this condition.

Histamine.—B. Shanson (Harrogate) and C. G. Eastwood²¹ (Leeds) discuss

the use and action of histamine in rheumatism. They conclude that histamine has a definite place in the treatment of fibrositis and neuritis, and in all chronic rheumatic affections associated with pain and limitation of movement. With histamine it is possible completely to cure fibrositis and neuritis, and almost invariably to decrease or remove joint pains in other suitable cases. The process of ionization with histamine requires unremitting attention during the whole of the sitting, and, even more important, the tolerance of a given patient both as to time and milliamperage varies greatly from day to day.

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RHEUMATIC INFECTION IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

Since this subject was last reviewed (*MEDICAL ANNUAL*, 1932, p. 450) the number of publications dealing with juvenile rheumatism has been very large; yet in trying to recall the events of these last few years of most moment to the study of this disease, it is inevitable that uppermost in our thoughts comes the remembrance of the death of Dr. Carey Coombs in 1932. Curiously enough, he left behind him in the form of a lecture¹ which he composed, but did not survive to deliver, a retrospect of those thirty years he had so tirelessly devoted to the investigation of rheumatic heart disease. This lecture was delivered by his friend and colleague, Dr. Bruce Perry, at University College Hospital, London, on March 14, 1933. While thinking of recent general surveys of juvenile rheumatism, we must specially welcome W. Sheldon's² article on this disease appearing in the third edition (1934) of *Diseases of Children*, edited by Garrod, Batten, and Thursfield. To have a new full-length text-book description of juvenile rheumatism written by one of the younger authorities on the disease is both pleasing and interesting.

Reviewing the work done in juvenile rheumatism since 1932, it may be said at once that it has been almost entirely concerned with points that really matter, and investigations have chiefly centred round such questions as those of the mass-production of the disease, the pathogenesis in the individual child, and the criteria of infection in individual cases. Most of the newer work of importance can be covered under the three headings of: (1) The possible allergic factor in the production of juvenile rheumatism; (2) The association between hæmolytic streptococcal infections and rheumatism; (3) Studies in the sedimentation rate in rheumatism. In dealing with these an attempt will be made to show their relationship to the hitherto unsolved problems in connection with this disease of childhood.

Allergic Factor.—The possibility of an allergic factor coming into play in the production of an attack of acute rheumatism is no new hypothesis. It dates back at least to 1928, when C. H. Swift, C. L. Derrick, and C. H. Hitchcock³ wrote: "There is much clinical evidence to support the contention that focal infection has an important bearing on the evolution of this disease, but up to the present the importance of the focus was thought to rest in its rôle as a nidus, from which the virus was disseminated throughout the body. Our conception of the focus, on the other hand, is of an area where the allergizing substance is produced and whence it is spread to sensitize the various tissues. This

conception does not deny that virus may also gain entrance to the blood-stream from the focus, but stresses the allergizing effect of such a focus. From this hypothesis it is easy to understand that the state of the tissues of the patient is the characteristic feature of the disease and that the specificity of the streptococci recovered may play a relatively unimportant rôle."

Excuse may readily be made for those who regard the invocation of a possible allergic factor in rheumatism as a mere dragging-in of a fashionable idea of the moment; and, indeed, no less an authority on allergy than Dr. John Freeman has spoken somewhat sharply against it. Nevertheless the subject cannot be dismissed off-hand, and for this reason: up to the present there has always been some unexplained factor operating in the infecting of a child with acute rheumatism, and the question is if a hypothesis involving an allergic sensitivity supplies the explanation so much needed.

The position can be briefly explained. It has long been recognized that juvenile rheumatism is not due to a merely fortuitous meeting of a child with a germ. The non-hæmolytic streptococcus to which the disease may be attributed cannot be distinguished from that normally inhabiting the alimentary tract, from that found in certain cases of malignant endocarditis, or from that found in infections which are not in any way connected with rheumatic attacks. What, then, has happened? What has given the infecting germ what Coombs called its "parvenu pathogenicity"? Various hypotheses have been put forward to explain these difficulties, none of them too successfully. It has been thought that in some way the virulence of the streptococcus is exalted in the tonsil, so that it emerges into the blood-stream in a very different state from that it possesses as a harmless saprophyte in the mouth. But it may not be an alteration in the micro-organism; it may be some change in the soil to be infected (i.e., the child) which accounts for the appearance of the disease in it. In the days when the 'specificity' of micro-organisms was spoken about more light-heartedly than is now possible, and it was thought that the term meant something quite definite, it went sorely against the streptococcal hypothesis of rheumatism that the streptococcus, acting in such a 'specific' way clinically, refused to show 'specific' reactions in laboratory tests for the differentiation of the streptococci. Ultimately it seemed as though the correct culture-medium for the display of the specific action of the streptococcus was the living human body, and this again lays emphasis on the 'soil' rather than the 'seed'. Are we, in short, on the wrong tack when we seek to explain the determining factor of an attack of rheumatism as an alteration in the virulence of the invading germ, and ought we to think in terms of some tissue change in the child as the factor we are looking for? If so, is this alteration the result of an allergic hypersensitivity?

If an allergic factor is to be sought, there are certain suggestive points. It is manifest, as Sheldon² points out, that rheumatic children suffer frequently enough from minor sore throats to enable them to be sensitized to the infecting virus. Again, B. Schlesinger⁴ has recalled to our attention the 'silent' period, lasting ten to twenty-one days, so often elapsing between the initial sore throat and the subsequent systemic attack of rheumatism.

The chief objection to the acceptance of an allergic response as the explanation of an 'explosion' of rheumatism lies in what has been for many years an accepted fact—namely, that the outbreak of systemic rheumatism is the result of a blood-stream infection. Now, do we know any admitted allergic phenomenon in which allergic sensitivity shows itself by a flooding of the blood by the micro-organisms to which the patient has become sensitive; and if we do not know of such a thing, can we imagine it as part and parcel of allergy? Yet we cannot jettison Coombs's work which has been taken to prove the

bacteraemic origin of systemic rheumatism by the study of the inflammatory tissue reactions, to say nothing of the recovery during life and after death of streptococci from rheumatic patients and lesions. Schlesinger⁴ feels the difficulty and is pressed into the following position: "there still remains the problem of how such nasopharyngeal infections manage to light up rheumatism in far distant areas of the body. The repeated failure of attempts to demonstrate streptococci in the inflammatory lesions of rheumatism is strong evidence against the idea of a great exodus of living bacteria from the inflamed throat into the general circulation. There must be some other way in which these violent inflammatory reactions are brought about." He suggests that "the patient's defence mechanism only comes into full force ten to twenty-one days after the throat infection, and there is a violent reaction."

At this point we must recall the experiments made six or eight years ago by Swift and his colleagues in America. They were able to produce in rabbits with non-haemolytic streptococci a peculiar hypersensitive condition in which minute injections of streptococci, far too small to produce any recognizable lesion in a normal animal, were followed by marked inflammatory reaction. Further, they found that animals sensitized to one strain would react abnormally to a different as well as to the sensitizing strain of micro-organisms. Now it is evident that here we have an observation of first-class importance in connection with the problems being discussed. In the first place we have an experimental infection much more analogous to human infection than has been produced before. It will be remembered that experimental rheumatism has been produced by massive doses of infecting streptococci, whereas human rheumatism has been regarded as a thin stream of infection frequently repeated. Secondly, the possible bearing of these experiments on the production of human rheumatism and its association with preceding haemolytic streptococcal infections is obvious. Clearly if these phenomena be within the range of allergic reactions, we cannot brush aside an allergic factor in the production of rheumatism as an impossible conception.

Haemolytic Streptococcal Infections and Rheumatism.—The establishment of wards and institutions for the prolonged care of children with rheumatic heart disease has brought to the fore the relationship between haemolytic streptococcal infections and rheumatic infection. The observation is that an epidemic haemolytic streptococcal nasopharyngeal infection, occurring in such surroundings, is capable of setting up, after the usual 'silent' period, an outbreak of acute rheumatism. This is not an entirely new observation, but the massing together of rheumatic children has emphasized the frequency and direful effects of this possible sequence. Of the facts there are no doubt. B. Schlesinger,⁵ W. Sheldon,⁶ and W. R. F. Collis⁷ have described such outbreaks. J. A. Glover⁸ and W. H. Bradley⁹ have given accounts of similar outbreaks in schools. A. F. Coburn,¹⁰ and Coburn and R. Pauli,¹¹ have found that the prevalence of haemolytic streptococci in the throats of rheumatic children leads to relapses, whereas their absence gives freedom from such sequels. W. A. R. Thomson¹² has described four cases of primary rheumatism following similar infections, in one instance from a puerperal infection with haemolytic streptococci; and H. J. Gibson and W. A. R. Thomson¹³ have found the association between haemolytic streptococcal infection and rheumatic infection far closer in epidemic than in sporadic cases of rheumatism. Various pathological tests, skin, agglutination, and precipitin reactions, have been employed in an attempt to incriminate the various streptococci (W. R. F. Collis, W. Sheldon, and N. G. Hill,¹⁴ B. Schlesinger and A. G. Signy,¹⁵ A. F. Coburn and R. Pauli.¹¹) The value of the results obtained depends upon what reliability can be attributed to the tests employed.

Now as to the meaning of all this. It may be accepted that epidemic nasopharyngeal infections may set up epidemics of rheumatism in rheumatic children. This seems perfectly clear, and it cannot be doubted that an epidemic of scarlet fever would do the same thing in the same circumstances. It can hardly be doubted that the micro-organism involved in the catarrhal epidemic is a hæmolytic streptococcus: it is often found in pure culture in the height of the epidemic (W. R. F. Collis¹⁶), and even if not in pure culture, from what we know of the hæmolytic streptococcus, it is not its habit to play second fiddle to other streptococci. It may also be accepted that this nasopharyngeal infection spreads by droplet infection from one child to the next. Although, therefore, it may be taken as proved that the hæmolytic streptococcus can set up rheumatism, especially in epidemic form, it does not follow that all attacks of rheumatism are set up by it, still less that rheumatism is due to a blood-stream infection by a hæmolytic type of streptococcus or is itself a directly communicable disease. The analogy between these epidemic catarrhs and scarlet fever in their effect on rheumatism is particularly close, and should be borne in mind.

J. A. Glover¹⁷ wishes to go a good deal further than this. He regards the prevalence and distribution of juvenile rheumatism as largely determined by the incidence of throat infections, latent or active, by hæmolytic streptococci. In other words, he thinks that waves of acute rheumatism are preceded by an increased carrier-rate of hæmolytic streptococci: when the carrier-rate becomes high, then the prevalence of rheumatic infection increases. This is a fascinating conception, and there is nothing in our knowledge of juvenile rheumatism that makes it impossible. It is a question of proof. One of the points in dispute is the old one whether the incidence of rheumatism increases strictly as poverty increases, in which case overcrowding is likely to be a factor of importance, as the epidemiologists hold; or whether, as many hospital physicians have found, this is not the case. The point has been once more debated.¹⁷ Those who hold, as the reviewer has held, that much of the mass-production of juvenile rheumatism centres round throat infections, cannot fail to be attracted to Glover's views.

The association between hæmolytic throat infections and systemic rheumatic infections is clearly a matter of both epidemiological and clinical importance. It remains to be worked out in what proportion of cases such association is of practical significance, and, indeed, the whole question raises problems yet to be solved.

Sedimentation Rate.—This phenomenon, first observed by Fahraeus in 1917, has been much used in chronic infections as a test for the activity or quiescence of the infective process. Now this is precisely one of the difficult problems in cases of juvenile rheumatism, particularly of rheumatic carditis. In spite of many efforts on more precise lines, the evidence on which we have to form an opinion in this matter is only indirect and none too certain. We assume that infective activity has died down when the following points are positive: increase in weight and colour of the patient, normal temperature, and normal sleeping pulse-rate. The last point has been recently emphasized by B. Schlesinger²⁶ in a paper which is worth studying. The question is whether the sedimentation rate provides a test of the activity or quiescence of the rheumatic infection which is more precise and trustworthy than the clinical points mentioned. In view of the immense advantage to be gained if the test worked out accurately, a good deal has been written on the subject of late (G. Kahlmeter,¹⁸ Y. Akerrew,¹⁹ W. W. Payne,²⁰ F. Bach and N. G. Hill,²¹ R. R. Struthers and H. L. Bacal,²² E. C. Warner,²³ and C. Bruce Perry.²⁴)

Unfortunately many methods of performing this test have been described, so that it is not always easy to compare the results of different investigators. W. W. Payne²⁰ has evolved a method particularly suitable for children in that it avoids vein puncture. Again, we need to know in what ways the sedimentation rate varies in health and ill health amongst children. M. G. Peterman and S. J. Seager²⁵ have studied this point and conclude that single readings giving a normal or slightly altered rate are none too trustworthy, but that even a single rapid rate indicates some abnormality.

The sedimentation rate would be of particular value in juvenile rheumatism if it could be trusted to indicate that active carditis is at an end, for it is in judging the infective activity in the heart itself on which so much depends. Bruce Perry²⁴ has made a careful study of 167 children with rheumatic heart disease directed to this point. He finds that acute carditis is always associated with a high sedimentation rate; but that the converse is not necessarily true, as 18 per cent of cases of clinically quiescent carditis showed an abnormal rate. Nevertheless it is evident that an abnormal rate must be regarded as very suspicious of active cardiac infection. Further, a single normal reading does not preclude the presence of a smouldering infection: with repeated normal readings such a possibility becomes increasingly unlikely. Within these limitations the sedimentation rate is to be taken as an accurate index of active infection in rheumatic carditis.

Another interesting point is made by Bruce Perry in the matter of the sedimentation rate and the probability of relapses, one of the features of rheumatic infection in the young. Generally speaking, he finds the return to the normal rate is of good omen as far as the probability of immediate relapse is concerned; yet exceptions occur, and it is possible for a case with normal readings to relapse within two or three weeks. This raises the question whether such relapses should be regarded as reinfections during convalescence rather than recrudescences of a smouldering infection. In the reviewer's opinion both types, reinfections and recrudescences, can be suspected on clinical grounds, and the study of the sedimentation rate may perhaps help to distinguish the two types more clearly.

It should be noted that with the onset of congestive heart failure the sedimentation rate returns to normal.

One other point has been brought out in the study of the sedimentation rate in juvenile rheumatism by several workers (R. R. Struthers and H. L. Bacal,²² E. C. Warner,²³ and confirmed by Bruce Perry^{23, 24})—namely, that chorea uncomplicated by carditis may (and usually does) show a normal rate. In many cases this might be accounted for by regarding the choreic movements as residual phenomena, symptoms persisting after the active infection of the brain has passed off. But this cannot explain all cases, since Perry has observed instances of chorea from their development onwards in which the sedimentation rate has remained normal. The explanation of this is not understood at present, but it is possibly analogous to the subnormal temperature which is often seen in chorea uncomplicated by carditis.

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RICKETS. (See VITAMINS.)

ROSEOLA INFANTILIS. (See EXANTHEMA SUBITUM.)

RUBELLA.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—R. Uehlinger-Frauchiger¹ describes an outbreak of rubella which took place in the scarlet fever department of the Zurich Children's Hospital between May 8, 1932, and April 1, 1933. The infection was apparently introduced by a girl with a scarlatiniform type of rubella, who developed scarlet fever eight days after admission to the scarlet fever ward. No special precautions were taken to prevent the spread of the disease owing to its trivial nature and the lack of accommodation. The result was that 76 of the 223 scarlet fever patients exposed contracted rubella. The first 37 cases were of the usual mild type, but subsequently many severe cases occurred.

J. V. Carroll² examined the blood in 30 cases of rubella and found plasma cells in all. These cells, which appeared relatively early in the disease in the usual proportion of 2 per cent, were chiefly of the Marshalko type (round or oval cell outline with a smooth edge) and increased generally up to the third day to about 3 to 11 per cent. Henceforward their number gradually diminished, until by the end of the second week they had practically disappeared. Türk cells, which morphologically come between the plasma cells and the lymphocytes, were often present, but were not so constant as the plasma cells. The lymphocytes were also increased in number, especially from the fourth or fifth day onwards. The number of monocytes was also increased. No myelocytes were seen.

DIAGNOSIS.—As he could find practically no plasma cells in scarlet fever, whooping-cough, serum rashes, anomalous rashes, and normal blood, Carroll² maintains that the diagnosis of rubella can be helped to a large extent by the finding of plasma cells and Türk cells in the blood. As, however, they are also found in the blood of measles cases, a definite diagnosis is very improbable.

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SCABIES.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Cat Scabies.—H. MacCormac¹ describes two groups of cases of scabies caught from cats. In the first, a lady and her two daughters were infected, while in the second case a lady, her daughter, and housekeeper were attacked. The author points out that this condition is rarely diagnosed but that infection of cats with scabies is fairly common, and he wonders whether such cases are frequently overlooked. In cats the infection begins on the ears and in their immediate neighbourhood, extending backwards over the head. The eruption consists primarily of papules and vesicles with subsequent formation of thick greyish yellow crusts. Later the hair falls and the skin on the head becomes infiltrated and furrowed, resembling the convolutions of the brain. A purulent conjunctivitis may be present. In exceptional cases the eruption involves the feet and the sacral region. The disease is accompanied by pronounced itching. The diagnosis can be confirmed by finding acari in scrapings, which should extend into the dermis.

In man the eruption differs from ordinary scabies in that it does not affect the interdigital spaces or the penis, and there are no burrows. Linear excoriations are not observed, nor does secondary pyoderma occur. The diagnosis rests upon the distribution of the eruption, its course, and the type of lesion met with. The lesions tend to group themselves asymmetrically on the trunk or arms, being numerous in the centre of the area, and more sparse at the

periphery. Sometimes they are almost confluent, forming what appears to be a patch of common urticaria. The eruption is composed of elements of a single type—an acuminate papule closely resembling lichen urticatus, capped by a tiny vesicle. The duration of the individual lesion is short: it rapidly fades, leaving a minute crust representing the original vesicle. The distribution of the eruption corresponds to the part of the unclothed body which has come into contact with the infected cat, and will generally be the result of taking the animal to bed. Severe nocturnal itching accompanies the efflorescence. Although the eruption dies out spontaneously in the human subject, it can be prolonged indefinitely so long as the cat is admitted to the bed. Its duration therefore depends upon the relations of the cat and its owner. The treatment is obvious. If the source of infection is removed the eruption ceases. Simple soothing applications may be used where necessary.

REFERENCE.—*Brit. Jour. Dermatol. and Syph.* 1934, Oct., 411.

SCARLET FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the report issued by the Health Section of the League of Nations,¹ there was an increase in the incidence of scarlet fever in 1932 and 1933 in Great Britain, France, Belgium, Holland, Germany, the Saar territory, Denmark, Switzerland, Czechoslovakia, Hungary, and Japan, while there was a decrease in Norway, Roumania, Yugoslavia, and Soviet Russia. The mortality remained more or less stationary in Finland, Lithuania, Austria, Poland, Greece, Turkey, Australia, and the United States. The general decline in the mortality of scarlet fever during the last ten years, especially in Northern, Western, and Central Europe, has been made possible by a progressive decline in the case fatality and only to an insignificant extent by improvement of notification of cases. In Eastern Europe, on the other hand, where the mortality is still high and unstable, the case fatality remains high.

In a paper on the epidemiology of scarlet fever in the landward area of Stirlingshire during the decennium 1921–30, J. Riddell² comes to the following conclusions: (1) The periodicity in this area is one of about five years; (2) Adults have an annual variation in incidence separate from that of children, and following that of children at about one year's interval; (3) While the maximum seasonal incidence in children is in October, with a smaller increase in January and February, the maximum in adults is in December and January, with a following increase in March; (4) The fewer the number of apartments in the house, the higher the incidence of scarlet fever among children, but the lower among adults; (5) The smaller the house, the earlier the average age of infection among children; (6) Females are more liable to infection than males, but girls are not infected until a later age than boys; (7) The maximum age of incidence for boys is 5 years and for girls 6 years.

In a study of the epidemiology of scarlet fever at Bratislava (Pressburg) during the period 1881–1930, A. J. Churra and S. Limbacherova³ state that whereas the fatality of diphtheria remained almost unchanged from 1860 until the introduction of antitoxin, that of scarlet fever during the last few decades has shown a remarkable decrease which cannot be attributed to treatment: 33.89 per cent of the cases occurred in the age group 1 to 5 years, 34.73 per cent between 6 and 10, and 16 per cent between 11 and 15 years. As regards case fatality, 65.12 per cent of scarlet fever deaths occurred during the pre-school period as compared with 86.4 per cent of the diphtheria mortality. Active immunization therefore against scarlet fever is desirable not only at the school age, when the incidence is highest, but also in the pre-school age, when the fatality is highest.

In a paper on secondary cases of scarlet fever W. H. Best⁴ states that from July 1, 1932, to Oct. 31, 1933, there were 2602 primary uncomplicated cases of scarlet fever in Brooklyn whose period of detention in hospital was only twenty-one days, and 243 secondary cases (8.5 per cent). In the remaining four control boroughs, where the period of detention was thirty days, there were 5810 primary uncomplicated cases with 598 secondary cases (9.3 per cent), so that approximately the same proportion of susceptible contacts developed the disease in the two groups. The prolongation therefore of the isolation period beyond twenty-one days in uncomplicated cases did not appear to be justified.

An epidemic of scarlet fever due to raw milk is reported by R. F. Feemster and J. M. Kingston⁵ at Bridgewater, Massachusetts, where 57 cases of scarlet fever and 38 cases of sore throat occurred on a milk route. The chronological occurrence of the cases suggested udder infection in the herd, and this view was confirmed by the discovery of hemolytic streptococci in the udder of a cow: 95 per cent of children under 5 years and 64 per cent of persons of all ages who drank the milk had either scarlet fever or sore throat. The incubation period was forty-eight hours or less.

BACTERIOLOGY.—J. D. Trask and F. G. Blake⁶ describe a new scarlatinal toxin which they isolated from the blood and pleural exudate of cases of scarlet fever which failed to give a therapeutic response to potent scarlatinal antitoxin, this being the first example of scarlatinal toxin demonstrated in a pleural effusion. They conclude that in view of the heterogeneity among scarlatinal toxins polyvalency is desirable in therapeutic scarlatinal antitoxin.

SYMPTOMS AND COMPLICATIONS.—In a thesis on *early nephritis* in scarlet fever, M. Eghbal,⁷ who records 13 cases in patients aged from 14 to 44 years, states that in addition to the ordinary nephritis of scarlet fever the kidney may be attacked in the initial stage, when the symptoms are quite different from those of later nephritis. The manifestations of the early nephritis may be merely albuminuria, or a more or less transient anuria. As a rule the condition can only be detected by dosage of the urea in the blood. During the initial stage of scarlet fever it is frequent to find a slight azotemia of between 0.50 and 1 gm. of urea; more rarely the amount may exceed 1 gm. per litre and rise to 3 or even 4 gm. The retention of urea usually does not give rise to any symptoms. In the absence of albuminuria the existence of a high azotemia justifies the diagnosis of nephritis. In cases which recover the high azotemia rapidly diminishes, and the kidney soon regains its functional capacity. A. Lenierre and R. Laplane⁸ also report a case of early nephritis associated with *encephalitis*. Their patient was a woman, aged 27, who during the eruptive stage of scarlet fever developed azotemic nephritis as shown by a blood-urea of 3.25 to 3.80 gm. per litre. The nitrogenous retention was accompanied by a certain degree of acidosis, the alkaline reserve of the plasma being 35.2 on the eighth day of disease, when the blood-urea was 3.80 gm. The azotemic nephritis was not associated with albuminuria, casts, hematuria, oedema, or rise of blood-pressure, and did not appear to have any influence on the course of the disease. On the ninth day of disease bilateral ptosis occurred and complete inability to raise the eyeballs owing to paralysis of the superior recti. The lateral movements were not affected, there was no nystagmus, and the other cranial nerves were normal. Examination of the fundi showed bilateral oedema, most marked on the right side. The cerebrospinal fluid was under slight hypertension, was clear, and showed some lymphocytosis. There did not appear to be any relation between the ocular symptoms and the renal complication. The ocular symptoms disappeared within a fortnight.

J. I. Abrams and S. Friedman⁹ state that during the period 1928-32, out of 4215 scarlet fever cases admitted to the Boston City Hospital, 514 (12.4 per cent) developed purulent *otitis media*: 73.3 per cent of the cases were in children aged 6 years or less, who formed only 47 per cent of the total admissions; 53.1 per cent of the otitis cases occurred in males and 46.9 per cent in females. The highest incidence of otitis was during the first four months of the year, and the lowest incidence in July, August, September, and October. Out of 574 cases the right ear was affected in 210, the left ear in 153, and both ears in 211. The general incidence of *mastoiditis* was 2.5 per cent, and among otitis cases 20.6 per cent. Among the younger patients, in whom the incidence of mastoiditis was highest, complications were relatively rare. The writers recommend *mastoidectomy* for chronic otorrhoea in scarlet fever to preserve the hearing and to stop the infectious discharge.

G. D. Hooper and S. L. Cave¹⁰ made a study of *sinusitis* in two series of cases of scarlet fever, the first consisting of 292 patients whom they examined chiefly by X rays, while in the second series, consisting of 80 patients, they attempted to correlate the clinical with the X-ray findings. In both series X-ray evidence of *sinusitis* was present in approximately 90 per cent of the cases. In the first group there were 33 cases of otitis media and in the second group 12 cases. In all but one the sinusitis was on the side of the affected ear.

G. Dick, E. M. Miller, and H. Edmondson,¹¹ who record a personal case, state that only 15 examples of *gangrene of the extremities* in scarlet fever have been reported, the first by Lister and Hudson in 1858 and the last by Sutherland in 1930 (see MEDICAL ANNUAL, 1932, p. 468). In 11 cases which were available for study the ages ranged between 3 and 40 years. In all but one the attack of scarlet fever was mild. In over half the cases some other complication, such as nephritis, secondary adenitis, or otitis was present. The date of the onset of the gangrene ranged from the seventh day of illness to nine months afterwards, but in most the gangrene appeared from fourteen to twenty days after the beginning of the disease. In 10 cases the gangrene was limited to the legs, in 7 being unilateral, and in 3 bilateral. In one case the hands only were involved, and in another case both hands and both feet were affected. The mortality was about 50 per cent. One patient recovered spontaneously after sloughing of the gangrenous portions of the toes and feet, 4 died without operation, and in 6 operation was performed and recovery took place. The pathological changes in the gangrenous extremities consisted in 4 cases of thrombosis of the artery, and in 1 case of embolism from vegetations on the mitral and aortic valves. In another case soft clots not adherent to the artery or vein were found after amputation. In 2 cases there was no evidence of either thrombosis or embolism, and in 3 the changes were not recorded. The writers' case was that of a girl, aged 7 years, who on the twentieth day of disease developed purpuric areas on the right foot, leg, both thighs, dorsa of both hands, and subconjunctival hæmorrhages, followed by hæmorrhagic gingivitis and tarry stools. The hæmoglobin content was 25 per cent, the red cells numbered 3,000,000, the leucocytes 24,000, and the platelets 150,000. The patient was given 200 c.c. of whole blood by direct transfusion. No further hæmorrhages occurred, but the purpuric areas on the foot and leg became gangrenous, and amputation was performed at the junction of the upper and middle thirds of the leg. Recovery took place. Examination of the amputated leg showed no gross or microscopical evidence of block in the arteries supplying the gangrenous area, but there was a recent thrombophlebitis of the large veins.

S. Friedman¹² studied the *sedimentation rate* in 55 patients, aged from 4 to 55 years, with the following results. In very mild cases there might be no

increase of the rate at all. In ordinary mild cases the rate was elevated at first, but fell fairly promptly, and reached a normal level during the second week of the disease. In severe cases the rate remained at a high level throughout the patients' stay in hospital. Complications were accompanied by a rise in the rate unless it was already distinctly increased. No conclusions could be drawn as to the effect of the administration of convalescent serum or anti-toxin on the sedimentation rate.

PROPHYLAXIS.—J. Cantacuzène¹³ reports the results of active immunization against scarlet fever with a scarlatinal anatoxin prepared according to Ramon's method by treating the toxin with 30 per cent formalin and keeping the mixture for six weeks at 37° C. Three subcutaneous injections were given in doses of 0.5 c.c., 1 c.c., and 1.5 c.c. Among 1158 children inoculated at Jassy the protective action of the vaccine was absolutely nil, while at Bucharest the incidence of the disease was twice as high among the controls as among the inoculated, but the numbers were not sufficiently high to be conclusive. Cantacuzène concludes that inoculation against scarlet fever by anatoxin has only a very slight preventive action on the incidence of the disease, at least under the conditions in which it was caused out in Roumania. The final settlement of the problem requires a further trial on a large scale during a severe epidemic and before it has reached its height.

H. G. Bull¹⁴ re-tested 50 children eight years after immunization and found that 32 (64 per cent) were negative and 18 (36 per cent) slightly positive; 22 had been given three doses of dilute toxin, and of these 10 were negative and 12 slightly positive, 28 had had five or six doses, and of these 22 (78 per cent) were negative and 6 slightly positive. Adequate doses therefore of dilute toxin confer immunity for at least eight years in a high percentage of susceptible cases.

REFERENCES.—¹*Epid. Rep. Health Sect. League of Nat.* 1934, xiii, 59; ²*Brit. Med. Jour.* 1934, i, 276; ³*Monats. f. Kinderheilk.* 1934, ix, 9; ⁴*N. Y. State Jour. of Med.* 1934, xxxiv, 411; ⁵*New Eng. Jour. Med.* 1933, ccix, 275; ⁶*Jour. Amer. Med. Assoc.* 1933, ci, 753; ⁷*Thèse de Paris*, 1933, No. 394; ⁸*Gaz. des Hôp.* 1933, cvi, 1761; ⁹*New Eng. Jour. Med.* 1933, ccix, 494; ¹⁰*Jour. Amer. Med. Assoc.* 1933, ci, 1121; ¹¹*Amer. Jour. Dis. Child.* 1934, xlvii, 374; ¹²*Amer. Jour. Med. Sci.* 1933, clxxxvi, 683; ¹³*Bull. Off. internat. d'Hyg. publ.* 1933, xxv, 2112; ¹⁴*Jour. Amer. Med. Assoc.* 1933, ci, 363.

SCHISTOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

DISTRIBUTION AND EPIDEMIOLOGY.—A Sierra Leone focus of *S. mansoni* infection is reported by H. Preston¹ at Kabala in the Northern Province. He found in the streams a species of *Planorbis* infected with what appeared to be a human type of cercaria. Schistosomiasis in the Sudan is reported on by R. G. Archibald,² who traces the spread of the disease to importation by Egyptian soldiers and by West African natives numbering 20,000 yearly passing through the Sudan on the Mecca pilgrimage. The disease is now present in eleven of the fourteen provinces, but the nearly rainless Red Sea area and Kassala are free. Both the vesical and intestinal forms are prevalent. Desiccation for a considerable time kills many of the non-operculated *Bullinus* and *Planorbis* snail carriers of the infection in waters, from wading in which infection takes place. *S. bovis* of cattle is also present. The age incidence of schistosome infection in Katanga in the Belgian Congo is recorded by P. D. Dixon,³ who found 5.1 per cent in the first five years, and 12.5, 30.7, and 23.4 per cent respectively in the next three five-yearly periods, and 11.3 per cent between 20 and 25 years of age, after which the figures are very small, as immunity has been acquired by then. Pathological lesions in the gall-bladder have been found post mortem by M. Hashim⁴ associated with bilharziasis of

the intestine, and he suggests that this accounts for the beneficial effects of emetine in some cases of cholecystitis in Egypt.

TREATMENT.—A. G. Biggam and others⁵ report on the *treatment of bilharzial papilloma of the lower part of the large bowel by diathermy* with the aid of a special instrument enabling the polypoid growths to be grasped and the current applied with the aid of another flat electrode under the buttock. A number of growths are dealt with at a sitting, which is repeated weekly with better results than those shown by any other method and without danger or pain.

The oral use of *acriflavine* in a form of schistosomiasis of the Belgian Congo, caused by a parasite of the *Haematobium bovis* group, is reported on by A. C. Fisher.⁶ A total dosage of 0.015 to 0.02 grm. per kilo. in children, and 0.01 grm. per kilo. in adults, with a maximum dose of 0.7 grm., was given in five daily doses of a .2 per cent solution. In 13 cases, including 11 children, ova continued to be passed unchanged in the faeces, but the remaining 39 cases became symptom-free within three days and ceased to pass any but degenerate eggs within one week, and in 2 cases watched for two months no recurrence had occurred, while no toxic symptoms were seen; so the method is worthy of further trial.

REFERENCES.—¹*Ann. Trop. Med. and Parasitol.* 1933, Dec. 12, 497; ²*Jour. Trop. Med. and Hyg.* 1933, Nov. 15, 345; ³*Trans. Roy. Soc. Trop. Med. and Hyg.* 1933, Dec. 3, 505; ⁴*Ibid.* 1934, Jan. 31, 399; ⁵*Ibid.* 409; ⁶*Lancet*, 1934, April 28, 897.

SCHIZOPHRENIA.

H. Devine, M.D., F.R.C.P.

CLINICAL.

Schizophrenia in Children.—From his study of six cases, H. W. Potter¹ says it appears that a typical schizophrenic reaction may put in its appearance long before the initiation of pubescence. Because the child is limited in his verbalizations, and his thinking is in the direction of concreteness rather than abstraction, what little delusional formation there is, is simple and naïve. The outstanding symptomatology is found in the field of behaviour and a consistent lack of emotional rapport. The drive for integration with the environment, so characteristic of normal children and so essential for their personality development, is outstandingly absent. The six cases reported and discussed here represent typical schizophrenia in children. Their actual ages on admission were 4, 6, 10, 11, and 12 years respectively. The three patients who were over 10 on admission presented undoubted evidences of the existence of their schizophrenia long before that age. With the exception of one case, none showed any physical indication of puberty. None of the cases showed any marked improvement over the period of hospitalization, ranging from three to eighteen months. The treatment was that of continuous effort to intrigue the child's interest through a carefully organized daily routine, modified to fit the individual. It was not possible to do a great deal with a direct psychotherapeutic approach because of the lack of an essential emotional rapport. There is a superficial resemblance of schizophrenic children to certain unstable mental defectives. The schizophrenic child often appears mentally deficient because the libido is invested within the patient himself, thus interfering with the objectification of the intellectual processes. The writer thinks that a careful psychiatric study, from a psychodynamic approach, of the patients in institutions for mental defectives, might demonstrate that schizophrenia in children is not as rare as is now generally believed.

Crime in Schizophrenic Types.—From his observations on criminal statistics, J. H. Murdock² notes that crime in schizophrenics is found most

frequently at those times when crimes are most frequent. Criminal schizophrenia occurs most often at that age at which most crimes are committed. Between the ages of 16 and 21 recognizable criminal schizophrenics are not so common as such: (1) Some have probably not exhibited their underlying state of mind, and are in prison or Borstal; (2) Some are in mental hospitals; (3) Some have not yet become insane at all. The discharge-rate of schizophrenia compares favourably with that of the average mental hospital. The prolongation of the period of care and control renders the recoveries more likely to be permanent. Heredity does not adversely affect the discharge rate. Previous attacks of insanity impair the prospects of recovery. The earlier the care and control and the longer the period of treatment, the better are the prospects of recovery.

Acute Schizo-affective Psychoses.—J. Kasinin³ discusses what he terms the acute schizo-affective psychoses. The group of cases which he describes carry the implication of a definite disease process going on to deterioration and dementia which an unbiased study of cases of this type does not really justify. His series included a group of nine cases which aroused interest on account of the special clinical picture which they presented. They were all diagnosed as dementia præcox. They were young men and women in excellent physical health, had average or superior intelligence, and they had no difficulty in coping with their work. Preceding the attack there was, however, a difficult environmental stress which served as a precipitating factor. The personalities of the patients were not much different from the general run of people in the community. They were well adjusted socially and were considered to be well integrated individuals who apparently got a good deal of satisfaction out of life. A subjective review of their own personalities revealed them as sensitive, critical of themselves, introspective, very unhappy, and preoccupied with their own conflicts and problems. These conflicts and problems may go on for years before the patient breaks down, and they are not apparent to others. The interesting thing about the psychoses is that one is able to reconstruct them psychologically when one reviews the various symptoms and behaviour with the patient after his recovery, and then they become fairly intelligible. The fact that there is comparatively little of the extremely bizarre, unusual, and mysterious, is what perhaps gives these cases a fairly good chance of recovery. They do not exhibit any profound regression socially, although the thought processes show primitive and infantile modes of thought. There is very little passivity in these cases. Their reaction is one of a protest, or a fear, without the ready acceptance of the solution offered by the psychosis.

These psychoses occur in young men and women and tend to repeat themselves. In the present series, there was usually a vague history of a previous breakdown with complete recovery, and then a recovery again after the psychosis which was observed.

A review of the dynamic factors in the psychosis shows a severe conflict between the instinctive drives of the patient, usually sexual, and the barriers and repression imposed by the social group. Many of the patients are young people in whom one would naturally expect a great deal of pent-up emotion and ideation about sex. But the unusual frequency with which the sexual conflicts stand out in the psychosis and the amount of the emotion association with it suggests more than casual association between the sex maladjustment of the patient and the psychosis. There is also a marked feeling of inferiority, especially in the subjective notions of these patients, that they are not able to adjust themselves socially. The psychosis is usually ushered in by a latent depression and a certain amount of rumination going on for some time until the more dramatic picture which is here described becomes apparent.

The psychosis itself is a very dramatic affair with the attempt of a quick and intense compensation. It is an extremely severe emotional experience through which the patient goes without accepting it as an end in itself. Life has a good deal to offer to the patients, the capacity for reintegration is present. There is not enough time for the thought processes to become disintegrated, and thus the recovery is made easier. Perhaps the fact that the patient had mild attacks during adolescence confers a certain amount of immunity upon him in undergoing a more serious psychosis.

Clinical Variables in Schizoid Personalities.—J. Kasanin, Z. Rosen, and P. Sage⁴ observe that the relation between pre-psychotic personality and pre-psychotic manifestations have been noted by many psychiatrists. Especially in the consideration of the functional psychoses, and affective and schizophrenic disorders, a dichotomy of personality types has been assumed, and has led, on the one hand, to the concept of the extroverted, cyclothymic, syntonic personality as associated with the affective psychoses, and, on the other hand, to that of the introverted, schizoid, shut-in type usual in schizophrenic breakdowns. Most writings on the subject fall into the domain of clinical intuition rather than science.

In an attempt to approximate scientific objectivity a statistical study of pre-psychotic personality was initiated at the Boston Psychopathic Hospital in 1928. The conclusions reached as a result of the research are summarized as follows by the investigators :—

1. The aim of this study was to answer two questions : (a) Do patients with similar schizoid personalities have similar clinical pictures when they break down ? (b) Can the schizoid personality be described in terms of a given constellation of traits ?

2. We have arbitrarily defined the schizoid personality as possessing five characteristics : few friends, shyness, seclusiveness, close-mouthedness, and extreme sensitivity.

3. Only 33 of 327 patients with all diagnoses were found to have had this combination of traits in pre-psychotic life ; 24 of these had schizophrenia, out of a total of 151 with schizophrenia.

4. The clinical picture presented in these cases varied greatly from case to case, with only slight superficial resemblances.

5. In spite of the allegedly unfavourable constellation of traits in the schizoid personality, the recovery rate was higher than in an unselected group of schizophrenic patients or in general hospital populations.

6. Analysis of factors favouring recovery did not reveal any single especially significant condition in all cases.

7. Of the 33 patients with schizoid personalities, the males were admitted to the hospital on the average ten years earlier than the females, pointing to certain conditions in our culture that lead to the hospitalization of maladjusted males at an earlier age than females.

8. Only 15.9 per cent of all the schizophrenic persons in the research had the specific combination of traits which we outlined as delineating the schizoid personality. These traits, however, were singly most commonly found in the schizophrenic group, together with 'neurotic traits', 'model child', 'close attachment to the family', 'little self-assertiveness', 'frequent day-dreaming', 'great ambition', 'total abstainers', and 'non-smokers'.

9. Significantly associated with the nucleus of five traits which we selected were 'little self-assertiveness', 'no sense of humour', 'frequent day-dreaming', 'little output of energy', 'feeling of inferiority', 'fusses over pain', 'very absent-minded', 'regular church-goers', 'non-smokers', 'total abstainers', 'neurotic

traits' in childhood, and 'unusual attachments' to some member of the family in adult life.

10. It was noted that, in the transition from childhood to adult life, the neurotic traits decreased noticeably in the schizoid group, while practically all other schizoid traits increased.

11. The five traits which we assumed to be basic in the schizoid personality are not unitary traits but can be readily split into other functional components.

12. A review of various clinical data reveals that the most frequent factors associated with the schizoid personality are over-attachment to the family, maternal over-protection, paternal neglect, physical defects and anomalies present in practically all of the cases, and unsatisfactory heterosexual adjustments.

13. Finally, we believe that a description of the schizoid personality by traits does not give a true picture of the personality or of its dynamic relation to the psychosis.

PSYCHOPATHOLOGY.

The Parent-Child Relationship in Schizophrenia.—J. Kasinin and E. Knight⁵ are responsible for the study of this subject. The writers deal especially with over-protection-rejection. Since schizophrenia began to be looked upon as a personality disorder a great deal of attention has been paid to the study of the relationship of the parent to the schizophrenic child. It was shown that this relationship was not always a wholesome one. It seemed that many children who later on developed a schizophrenic syndrome have been unusually guarded, over-protected, or shielded by their parents in childhood or adolescence. The children were often found to be the centre of emotional storms in the family, and in many cases the parents were so wrapped up emotionally in their children that they hampered their development, and probably interfered with their psycho-sexual maturity. The failure of the heterosexual adjustment of the schizophrenic has been brought out by H. S. Sullivan,⁶ who pointed out that schizophrenics rarely marry. Later, D. Levy⁷ crystallized out the concepts of maternal over-protection and rejection, and established categories or the delimitations of this concept.

Levy explains that the term 'maternal over-protection' is synonymous with excessive maternal care of children. It connotes such terms as 'babying', 'over-solicitude', 'too much mothering', 'over-indulging', and a host of similar expressions indicating that the mother exceeds the 'normal' in her care of the child. According to clinical observations, the excess may be formulated in terms of: (1) Excessive contact, e.g., a mother sleeping with her son aged 14; (2) Prolongation of infantile care, e.g., breast feeding to the age of 4 years; (3) Prevention of the development of independent behaviour, including such descriptive terms about the mother-child relationship as, 'She won't take any risks', 'She always fights his battles'; and (4) Lack or excess of maternal control, shown in over-indulgence of the child in regard to privileges or possession, and by the child's disregard of eating and sleeping time—in general, by his doing what he pleases undeterred by the mother's commands or pleadings. This is in contrast with excessive maternal control in which a relative over-modification of infantile traits is manifested in undue obedience on the part of the child. There are many conditions in mothers' lives which cause over-protection: Long period of anticipation and frustration during which a woman's desire is thwarted; conditions in the child that make him a greater hazard for survival than other children; sexual incompatibility with husband; social isolation and lack of common interest between husband and wife; emotional impoverishment in early life; unhappy childhood; development

of dominating traits through the assumption of undue responsibility in childhood and the continuance of this rôle in marriage: and, finally, thwarted ambition.

Kusanin summarizes the results of his research on the parent-child relationship in schizophrenia as follows:—

1. In a series of 45 unselected cases of schizophrenia, maternal over-protection or rejection was present in 60 per cent of the cases. Rejection was found in only 2 cases, with evidence coming from the patients themselves.

2. In schizophrenia the over-protection frequently extends into the adult life of the patient and even into his hospital life after commitment.

3. The biological inferiority of the schizophrenic child is easily detected by the parents and serves as one of the principal causes of over-protection. One must remember that the pre-schizophrenic child invites and solicits the extra care and attention on the part of his parents.

4. Over-protection establishes a vicious circle in the life of the schizophrenic child, because, on the one hand, the child needs the extra care for his development, but, on the other hand, receiving this extra care hinders his final development, his emancipation from his parents, and his psychosexual development.

PSYCHOTHERAPY.

Reinforcing Mental Analysis in Cases of Psychosis.—C. Allen⁸ records some personal experiments. He observes that throughout the history of psychiatry it has been notorious that the hallucinations and delusions of psychotics are uninfluenced by any therapeutic procedure. Some psychiatrists have reported good results in early cases, and this is his own experience also. It would seem that if the patient is to influence himself, some kind of auto-suggestion is essential. Auto-suggestion has been tried in the past, however, and abandoned as useless. The four experiments tried by the writer in three schizophrenic patients seem to show that suggestions have been wrongly applied and have been directed to increase the repressions on some powerful complex. The experiments described appear to show that this is futile and dangerous, and indicate how suggestions can be applied to influence complexes with safety and some certainty. The writer suggests that the method of analysis he describes can be used as a method of research or as a therapy. He states that the results obtained in these four cases bear out Freud's assertion as to the homosexual element in paranoid diseases.

The Treatment of Narcissistic Neuroses and Psychoses.—L. Pierce Clark⁹ observes that while we may learn a great deal about narcissism by applying the technique of ordinary analysis, we fail to help the narcissist. Some new method must be evolved. The attitude toward the mental disease is one of 'watchful waiting', and yet a fairly large number of cases, for all practical purposes, recover. In each individual case it seems as though some combination of fortuitous circumstances has had influence. The inference is that the therapy of 'watchful waiting' allows the ego to take its own time in gradually adapting itself to the outer world. The value of the fortuitous circumstances mentioned apparently consists in their providing to the weak ego the love and support it requires, and in their granting it the extended opportunity for slowly making ready for the changes which the instincts and reality impose. The purpose of a psycho-analytic technique would be to make such an outcome less the result of chance, more the product of enlightened effort. It may be that the relationship of analyst and patient will never assume the conditions of an ordinary transference-analysis; but through a modified technique the ego is given the chance to resume its interrupted growth at a speed of its own choosing. It can be made possible to discharge emotions without at

once facing the retributions of the real world. It should be a relationship where the analyst goes with the patient rather than the reverse. Thus is promised the possibility of overcoming that primary mountain of resistance which has hitherto defeated most attempts to analyse the narcissist.

The early stages of treatment may conform largely with the pleasure-principle, but eventually as the transference becomes stronger there must be slowly offered an influence towards accepting the reality-principle. The ultimate aim of therapy would be to bring together narcissistic libido and object-libido into a united release upon real activities. It must be held that it is possible to strengthen the ego. All that is asked of the patient is that he talk about himself. The problem becomes one of allowing the analyst to be recognized as not completely attached to the patient's ego but requiring some projection of libido in order to gain narcissistic satisfactions. Once a narcissistic transference is established the procedure is very similar to that followed in the analysis of the transference neuroses. The danger may be that too much may be expected of the narcissistic patient.

PATHOLOGY.

Sleep and its Relationship to Schizophrenia.—J. H. Ewen¹⁰ suggests that a state of parasympathetic stimulation may exist in schizophrenia. The negative results given by ergotamine may be due to, in part, an already intense depression of the sympathetic, an obliteration of sympathetic tonus by an overwhelming action of the parasympathetic. The main function of the parasympathetic is to preserve and economize energy. This fact may be deduced from its known action upon the bodily organs. Its inhibitory action upon the heart, its protective action on the eyes, its rôle in digestion and absorption by which the bodily defences are built up—all these functions of the parasympathetic are intimately related to conservation of and provision for the proper functioning of the organism. Sleep is also a process by which economy and repair take place, resulting in a restoration of energy and a renewing of activity. Sleep, according to the hypothesis of Hess, is also a parasympathetic function.

The similarity between sleep and schizophrenia has often been noted, and schizophrenia has been tentatively described as a state of modified sleep. Sleep is a process by which energy is restored. A comparison of the physical and mental state present in sleep with the physical and mental manifestations found in schizophrenia shows a considerable degree of similarity. In schizophrenia the appreciation of sensory stimulation is blunted. Circulatory changes are shown by the cyanosis and oedema of the extremities prevalent in the schizophrenic and by the flat top of the pulse-wave. The response of the respiratory centre to CO₂ is depressed in schizophrenia and in sleep. The muscle-contraction curve in schizophrenia is flat-topped. The blood-pressure is low and the basal metabolic rate is low both in schizophrenia and in sleep. Mentally both the sleeper and the schizophrenic are out of touch with reality, and environmental contact is lost. A vegetative or vagotonic state is present in both. Schizophrenia regarded from this standpoint may, then, be likened to a modified form of sleep.

The evidence that led Hess to the conclusions that sleep was due to parasympathetic activity was in the main threefold. In the first place, it is generally agreed that the parasympathetic system preserves and economizes energy, protects against strain, and tends to restore activity. It effects economy and repair. Sleep is a process by which these essentials to the well-being of the organism are carried out, but, be it noted, at the cost of deficiency in preparedness for immediate action. Secondly, the parasympathetic

innervates the pupillary sphincter, activation of which muscle contracts the pupil. During sleep the pupil is contracted. Hess takes this fact as evidence of a change in the equilibrium between sympathetic and parasympathetic systems, the parasympathetic predominating in sleep. Lastly, he found by experiment that activation of the parasympathetic resulted in a state of sleep. Stimulation of the parasympathetic by injections of ergotamine into the third ventricle of animals produced contraction of the pupil and a state of sleep. Electrical stimulation of the portions of the brain-stem with which the regulation of vegetative functions is associated resulted in a state characteristic of physiological sleep.

Blood-cholesterol in Schizophrenia.—J. Looney and H. Child¹¹ give the following summary of their investigations on the blood-cholesterol in schizophrenia: Approximately fifty men with schizophrenia were studied over a period of seven months at intervals of two weeks and of three months. The cholesterol content of the whole blood was determined by the method of Myers and Wardell. The mean cholesterol values were 146 ± 3 mgrm. per 100 c.c. for the first period, 161 ± 2.8 mgrm. for the second period, and 166 ± 2.5 mgrm. for the third period. The mean value for twenty-six normal men was 175 ± 5.2 mgrm. Both the schizophrenic patients and the controls showed great variability in the cholesterol values, the former having a standard deviation of about 20 mgrm. and the latter of 27 mgrm. The difference between the mean value for the first period and those for the last two periods is believed to be due to a seasonal variation in the cholesterol content of the blood. No correlations could be shown between the blood-cholesterol and the basal metabolic rate or the emotional status. Schizophrenia seems to be characterized by a slight degree of depression of the cholesterol content of the blood.

A similar research has been carried out by P. Schuby.¹² After a survey of the literature on the subject and a discussion on the relation of cholesterol to metabolism, the results of a study of 55 cases of schizophrenia with a range of blood-cholesterol values of 55 to 300 mgrm. are given. Many of the factors which might alter the blood-cholesterol other than that induced by the mental disorder itself were investigated. It was found that there is a definite tendency to a lowered blood-cholesterol in schizophrenia as a group. There are cases in which the cholesterol is normal or increased, but the majority of cases show values below the lower limit of normal or in the lower limits of the normal range.

Blood-sugar in Schizophrenia.—W. Freeman¹³ presents a study of the fasting blood-sugar levels as disclosed by 6 samples taken at standard intervals from 59 male schizophrenic patients over a period of six and a half months. In 95 per cent of 347 determinations the values lay between the conventional limits of normality, namely, 80 and 120 mgrm. per 100 c.c. The average value was 96.6 as compared with an average of 95.4 mgrm. in 31 normal control subjects studied by the same technique. Eight readings were obtained in the hypoglycemic and eight in the hyperglycemic ranges. The variations among the schizophrenics was higher than that in the controls, as was shown by the coefficients of variation, 11 and 6.9 per cent respectively. The samples were collected in pairs at fifteen-day intervals with intervening periods of two and a half months. There was a consistent drop in the average blood-sugar level from period to period, the first being 99.3 and the third 93.1 mgrm. per 100 c.c. These findings suggest that habituation, with a presumable lessening of emotional reaction to the test, played a part in determining the sugar level. The range of difference in consecutive tests also decreased consistently from one period to another; in the first the average difference was 10.6 and in the last 8 mgrm. per 100 c.c. No significant correlation could be

recognized between the blood-sugar level and the age, period of hospitalization, or severity of the psychosis. Of the subgroups, the hebephrenics showed the highest average level, namely, 99.7 mgrm., and the catatonics the lowest, namely, 92.7 mgrm. Conclusion: Schizophrenia is characterized by normal fasting blood-sugar levels, but the individual variability is somewhat greater than in normal subjects.

REFERENCES.—¹*Amer. Jour. Psychiat.* 1933, xii, 1253; ²*Jour. of Ment. Sci.* 1933, lxxix, 286; ³*Amer. Jour. Psychiat.* 1933, xiii, 97; ⁴*Ibid.* 640; ⁵*Jour. Nerv. and Ment. Dis.* 1934, lxxix, 249; ⁶*Amer. Jour. Psychiat.* 1927, vii, 105, 535; ⁷*Jour. Nerv. and Ment. Dis.* 1934, lxxix, 249; ⁸*Brit. Jour. Med. Psychol.* 1933, xiii, 151; ⁹*Psycho-analytic Review*, 1933, xx, 304; ¹⁰*Jour. Neurol. and Psychiat.* 1934, xiv, 247; ¹¹*Arch. of Neurol. and Psychiat.* 1933, xxx, 247, 567; ¹²*Amer. Jour. Psychiat.* 1933, xii, 1227; ¹³*Amer. Jour. Med. Sci.* 1933, clxxxvi, 621.

SCIATICA.

Ivor J. Davies, M.D., F.R.C.P.

E. D. W. Hauser¹ (Chicago) writes on sciatic neuralgia as a clinical entity and gives its symptoms, diagnosis, and treatment with a report of 60 cases. Before a reflex sciatica can be diagnosed, true sciatic neuritis must be excluded. The investigation is clearly described, together with an explanation of the pathogenesis of ordinary sciatica from static strains. These ideas are in accordance with F. Linstedt's² views: that chronic irritations result from functional fatigue; that functional fatigue, in his cases, was secondary to organic alteration of normal body statics; that the irritation of chronic fatigue may make the nerve of the involved part hypersensitive and produce pain along the course of the nerve. When such pains occur in the region of the sciatic distribution they are called sciatica. These views were confirmed by P. Haglund's³ vast experience; he also found that the removal of functional insufficiency by means of orthopædic measures cured the sciatica. This article presents an excellent account of a common and troublesome affection.

B. MacLean⁴ (Newcastle-under-Lyme) writes a practical article on sciatica and presents a simple classification: (1) Primary or true sciatic neuritis, this being an interstitial neuritis or perineuritis of the nerve-trunk; and (2) Secondary or pressure neuritis. Investigation on the suggested lines is necessary in every case, and treatment of the cause when possible. Epidural injection and manipulation may be necessary.

TREATMENT.—G. Slot⁵ (London) describes the treatment of sciatica by epidural injection. The two principles involved are: (1) Stretching of the nerve-roots by a harmless fluid; and (2) Manipulation. He states the method is easy, successful often in the most resistant cases, free from risk, and is in his experience the best available method for treating refractory cases of sciatica.

A. Frank⁶ (Briesen, Germany) recommends *gorun*, a combination of phenyl-chinolin carbonic acid, hexamine, and glycooll, for sciatica. The drug is prepared in the form of cachets and ampoules. In severe cases it is given first by intramuscular injection and afterwards by the mouth. He has also had good results from its use in neuralgia, gouty affections, muscular rheumatism, and rheumatoid arthritis.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1934, May 5, 1465; ²*Acta med. Scand.* 1921, liii, 218; ³*Ibid.* 1922, lvi, 658; ⁴*Med. Press and Circ.* 1934, June 20, 553 ⁵*Practitioner*, 1933, Nov., 581; ⁶*Med. Press and Circ.* 1934, clxxxviii, May 30, 484.

SCLEROMALACIA PERFORANS. Sir Stewart Duke-Elder, M.D., F.R.C.S.

A new clinical entity—a degenerative disease of the sclera—has been described during the last year by J. Van der Hoeve,¹ of Leyden. The principal symptom is the appearance of holes in the sclera which coalesce so that large gaps appear in which the uvea is seen lying either bare or covered by conjunctiva. Inflammation appears to take little or no part in the process, which

PLATE XLII

SEMINAL VESICLES

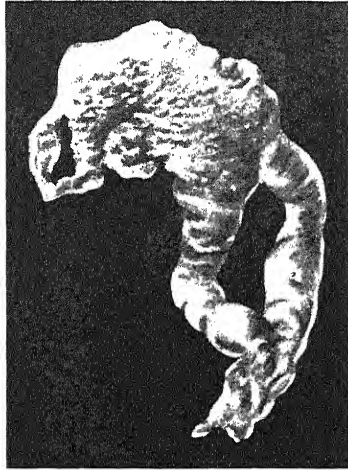


Fig. A.—Vesicular cast obtained by massage of the seminal vesicles. (After A. L. Wolbarst.)



Fig. B.—A seminal vesiculogram. (From Bailey and Love's 'A Short Practice of Surgery'.)

is essentially degenerative in nature. Of the four cases described it is interesting that three occurred in patients crippled with polyarthritis; in these the condition was slowly progressive and visual acuity rapidly failed. In the fourth case polyarthritis was absent, and relatively good vision was retained. No adequate treatment is known.

REFERENCE.—¹*Arch. of Ophthalmol.* 1934, xi, Jan.

SEMINAL VESICLES (Plate XLII). (See TESTIS AND APPENDAGES.)

SEPTICÆMIA.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Treatment by Antisera and Human Serum.—P. Lazarus Barlow and L. P. B. Chamberlain¹ draw attention to the fact that in some cases a very small blood transfusion brings about improvement after the use of antisera; the blood as blood could not have caused the change. They have tried the effects of fresh human serum in cases of septicæmia. Serum was used instead of whole blood so as to avoid any effect from the cellular elements of the blood.

The procedure was as follows. A case diagnosed as septicæmia or sapræmia was given an intramuscular injection of antisera, and if no improvement took place within twenty-four hours, an injection of fresh human serum was given. The streptococcal antiserum was preferred. It was made of equal parts of polyvalent and antiscarlatinal antisera. To obtain the human serum 50 c.c. of blood was withdrawn from the vein of a donor and centrifuged as soon as it had clotted. The separated serum was injected within half an hour after withdrawal, in part intravenously and in part intramuscularly.

Twelve cases of septicæmia are mentioned in this paper to illustrate the success of such treatment. There were only three deaths—the first from thrombosis of the vena cava, the second (an old woman) suffering from acute staphylococcal septicæmia (there was no satisfactory antiserum), the third from meningitis. In some cases it was found that a second dose of antiserum produced a fall in temperature without the use of human serum.

A simple method of giving the human serum is to take 20 c.c. of blood from any donor and to inoculate it immediately into the buttock of the patient. This procedure requires no special apparatus. Blood grouping is unnecessary unless the serum or blood is to be given intravenously. In ten of the cases mentioned there was improvement, often marked, after administration of the human serum, whereas none had been seen after administration of antiserum.

D. D. Pinnoek and H. H. Sanguinetti² describe two cases of septicæmia successfully treated with streptococcal (scarlatina) antitoxin.

Acute Staphylococcal Infections and Toxæmias.—C. E. Dolman³ states that staphylococcal antitoxic serum has been available for clinical trial in Canada for over two years: 104 cases of staphylococcal infection were treated by this serum with most encouraging results. The writer of the paper pleads for early diagnosis. He claims that with adequate surgical drainage of any pyogenic focus, staphylococcus antitoxic serum is a specific therapeutic agent of very considerable power.

REFERENCES.—¹*Lancet*, 1934, i, March 10, 503; ²*Ibid.* 507; ³*Canad. Med. Assoc. Jour.* 1934, xxx, June, 601.

SEROUS PLEURAL EFFUSIONS IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

The association between serous (stérile) pleural effusions and the later development of pulmonary tuberculosis is well recognized both in adults and children. In the former it is known that some 30 to 50 per cent of cases of this type of pleurisy will ultimately develop pulmonary tuberculosis, although it is

to be hoped that, with the care now expended on these patients, the outlook is better than these figures suggest. The association is also shown by the fact that rather more than a quarter of those showing pulmonary tuberculosis give a history of previous pleurisy.

D. W. Smithers¹ has made a useful investigation into the after-histories of children who have had serous pleural effusions. In his series the diagnosis had been confirmed by acupuncture in each case. He found that the condition most commonly occurred in older children and was rare under the age of 5 years; but of the 320 cases admitted to St. Thomas's Hospital with pleural effusion during the years 1920 to 1932 inclusive, 22 per cent occurred in patients under 15 years of age. The immediate prognosis was good in all instances, no deaths occurring among the 71 children. The ultimate outlook was by no means so good, judging from the after-histories of 32 cases which were traced and examined, between thirteen months and thirteen years after their illness.

Put briefly, the results of this follow-up investigation showed that 25 out of the 32 cases (that is, 78.1 per cent) showed no evidence of any form of tuberculosis and remained perfectly well, and 3 had vague symptoms but no definite evidence of tuberculosis. On the other hand, 2 had died of pulmonary tuberculosis, 1 had developed spinal caries, and 1 abdominal tuberculosis.

These figures suggest that, although the subsequent danger of tuberculosis is by no means remote, the outlook is better in children with tuberculous effusions than in adults; and it would have been interesting had the author been able to correlate his after-histories with the degree of care and the length of treatment following the initial illness. It may readily be presumed that in the case of children it is more easily possible to get prolonged after-treatment carried out than is practicable in adults who may be bread-winners or mothers of families.

REFERENCE.—¹*Arch. of Dis. Childh.*, 1934, ix, 246.

SERUM SICKNESS.

J. D. Rolleston, M.D., F.R.C.P.

J. Grant and M. M. Scott¹ report a case of severe serum shock in a previously healthy girl, aged 8 years, which developed three minutes after intramuscular injection of 5 c.c. of concentrated scarlet fever antitoxin. Recovery followed artificial respiration and hypodermic injection of adrenalin solution.

REFERENCE.—¹*Lancet*, 1934, ii, 80.

SEX HORMONES.

Sir Walter Langdon-Brown, M.D., F.R.C.P.

Eunuchoidism.—The question often arises whether, in a given case, hypogonadism is primary or secondary to anterior pituitary defect. I. Appelman¹ attaches importance to the following diagnostic points. In primary eunuchoidism there is an overgrowth of the long bones, resulting from delayed epiphyseal closure, while obesity is rare before the adult stage; even that produced by early complete castration is restricted to the trochanteric region of the thighs. Carbohydrate tolerance is normal, as is purin metabolism. In eunuchoidism secondary to hypopituitarism, the limb girdle distribution of the obesity is very marked, carbohydrate tolerance is increased, and uric acid is high in the blood, while its excretion is poor or delayed. It should be noted that he regards this pituitary influence as confined to the anterior lobe, and believes that overaction of the posterior lobe actually interferes with sexual maturity. [In that case why does not sexual precocity occur in young patients with diabetes insipidus?—W. L. B.]

(See also EUNUCHS AND HERMAPHRODITES.)

Ovarian Tumours associated with Secondary Sex Changes.—E. Novak and J. H. Long,² from a study of ovarian tumours, reach conclusions which

accord with those of Woollard (*see* ENDOCRINE SYSTEM, INTEGRATION OF.) Most ovarian tumours, of course, have no endocrine effect. The *Brenner tumour* has none, and this is presumably due to its originating in cells belonging to an early undifferentiated phase. From a similar phase the *disgerminoma* may arise, which likewise exerts no effect on sex characters. It occurs chiefly in persons with defective gonadal development, either male or female, and is rather characteristic of cryptorchids and pseudohermaphrodites. The ovarian tumours which influence sexual characters directly are :—

1. *The granulosa-cell tumour*, which is feminizing. The real germinal epithelium of the ovary is derived from the mesenchyme of the sex gland anlage. Nests of granulosa cells may be left over and give rise to tumours. The granulosa is a typically feminine cell, producing theelin. It is not surprising, therefore, that the hormonal effects produced by such tumours are along the lines of feminization. When they arise in elderly women, as they mostly do, the uterus increases in size and pseudomenstrual bleeding takes place. In a few cases granulosa-cell tumours have occurred in young children, and their hyperfeminizing influence was shown by precocious puberty and menstruation together with full secondary sexual characters.

2. *The arrhenoblastoma*, which is masculinizing. The rete of the ovary is not a mere analogue but the actual homologue of the male testis. In 1905 Pick described a tumour of the ovary made up of convoluted tubules resembling the seminiferous tubules of the testis. In only about one-third of the cases was there any evidence of masculinization. But in a more atypical, sarcoma-like, form of the tumour manifestations of defeminization or masculinization are the rule. According to Meyer they arise from certain undifferentiated cells persisting in the rete, which are potentially testicular, and which through their hormonal effects can override the feminine influence of the ovary. Removal of the tumour leads to a regression of the symptoms.

Witschi sums up the position by saying that the medulla of the gonad is a determiner of masculinity, and the cortex of femininity. Incidentally it is suggestive that cortical tumours of the adrenals, which are so closely associated with the ovarian medulla, characteristically produce syndromes similar to those seen with arrhenoblastomas.

Sex reversal in women may therefore be due to: (1) Overaction of the adrenal cortex or of the latent male cells in the rete ovarii, which overrides the influence of the germinal cells in the ovary; (2) Overaction of the basophil cells in the pituitary which may inhibit the activity of the germinal cells.

REFERENCES.—¹*Med. Jour. and Record*, 1933, June 7, 455; ²*Jour. Amer. Med. Assoc.* 1933, Sept. 30, 1057.

SHOCK, OBSTETRIC. (*See* LABOUR AND ITS COMPLICATIONS.)

SILICOSIS. (*See* PNEUMONOCONIOSIS.)

SKIN. (*See also* ACNE VULGARIS; ACTINOMYCOSIS; DERMATITIS MEDICAMENTOSA; DERMATITIS VENENATA; LUPUS ERYTHEMATOSUS; MELANOMAS, MALIGNANT; PRURITUS VULVÆ; PSORIASIS; SCABIES; VARICELLIFORM ERUPTION; VITILIGO.)

SKIN, FUNGOUS INFECTIONS OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Epidermophytosis.—R. Sabouraud¹ points out that the difficulty in treating epidermic mycoses is not in the killing of the parasite, because all the parasites are amenable to the action of antiseptics, especially *iodine*. The difficulty is to get at them. In foot ringworm antiseptics do not reach the

parasite unless the horny layer is thin, but in most cases it is much thickened. It is therefore necessary to destroy whatever hinders penetration of the antiseptics. He considers the most effective agent is *Brisson's depilatory*, a mixture of barium sulphide and starch. Water is added to make a paste, which is applied over the diseased surface; this is removed every quarter of an hour and the layer replaced by another. In this way the epidermis can be worn away sufficiently to allow tincture of iodine to penetrate. Even after this, daily friction and the application of 1 per cent iodine in alcohol should be continued, possibly for months, to effect a cure.

When the nails are affected he considers that evulsion, followed by painting the nail bed with iodine is the only satisfactory method, though when the nail is only partially involved the affected part may be scraped away with a dentist's burr.

B. Levine² has used *phenylmercuric nitrate* in the treatment of tinea and yeast infections of the skin with good results. The drug was introduced by Weed and Ecker in 1931. It is used either in the form of a lotion or an ointment. A lotion of 1-1000 in an emulsion of tragacanth was first used and this was found to be rather irritating, so 1-1250 was subsequently tried and found more satisfactory, though the lotion in some cases proved to have a drying effect. An ointment of 1-1500 in two hydrophilic bases containing cholesterol derivatives proved very satisfactory. For use the patient was instructed to cleanse thoroughly all affected parts by means of soap and water and a soft brush. A moderate amount of one of the preparations was gently rubbed in night and morning. Over-treatment must be avoided. Of 262 cases studied, 205 were followed up and the patients discharged as cured; 57 patients were lost sight of. Of the 205 cases, 193 had tinea, the remaining 12 interdigital saccharomycosis: 21 cases had secondary epidermophytides of the hands, and these cleared up promptly when the feet were treated; 5 patients with anal pruritus due to tinea were cured. Tinea of the groins, axilla, and other parts of the glabrous skin also responded promptly to treatment.

J. H. Buchbinder³ recommends the use of *cresophan* (also known as *abracide*) in the treatment of fungous infections of the extremities. Cresophan is a reaction product of metacresol and tertiary butyl meta-alcohol in which the tertiary butyl group is in the para position to the methyl group. It is only slightly soluble in water but soluble in alcohol and liquid potassium soaps. A liquid soap containing 10 per cent of anhydrous soap dissolves 5 per cent of cresophan and this concentrated solution can then be diluted with water in all proportions. For use the infected extremities are immersed in cresophan solution 1-1000 two or three times daily for fifteen minutes. The same solution is used over and over again. The excess is gently mopped off with a towel. The number of treatments varied from three to ten; the symptoms of the most chronic cases disappeared after five days. In acute cases one to three foot-baths were usually sufficient to bring about a complete cure. To combat reinfections a powder containing 2 per cent cresophan in boric acid was used.

S. Lomholt,⁴ in a discussion at the Annual Meeting of the British Medical Association, recommended the use of an ester of *oxybenzoic acid*, sold under the name of 'Mycocoten', in the treatment of this condition.

Paronychia.—E. M. Rockwood⁵ has described a new method of treating paronychia due to monilia infection. All the cases treated were proved to be infected by smears or culture; the majority of infections were due to *Monilia albicans* (thrush). The treatment consists of making a paste with *sodium perborate* and a little water. This is gently worked under the nail fold with a cotton-tipped tooth-pick, and is also packed around the sides and under the nail. Without any other dressing a rubber finger-cot is drawn on and allowed

to remain over-night. The purpose of the latter is to maintain and increase the moisture present. The patient is then instructed to soak the affected fingers three times a day in a warm solution of the sodium perborate made by adding two teaspoonfuls to half a glass of water, and to continue soaking as long as effervescence takes place; this may be from half to three-quarters of an hour. Cases are usually cured in from three to eight weeks.

Granuloma Coccidioides.—C. C. Tomlinson and P. Bancroft⁶ have treated two cases of coccidioid granuloma (a condition allied to blastomycosis) with intravenous injections of *tartar emetic combined with X-ray treatment locally*, as recommended by Guy and Jacob. The patients were given injections on alternate days of 2 to 8 c.c. of a 1 per cent solution of antimony and potassium tartrate, and $\frac{1}{2}$ skin unit of unfiltered X rays, at intervals of from ten to fourteen days. The injections were spread over three to four months. Cases are said to respond to this treatment when they have failed to respond to potassium iodide medication or X-ray treatment alone.

REFERENCES.—¹*Med. Press and Circ.* 1933, Aug. 30, 206; ²*Jour. Amer. Med. Assoc.* 1933, Dec. 30, 2108; ³*Med. Record*, 1934, March 21, 286; ⁴*Brit. Med. Jour.* 1934, ii, Aug. 18, 323; ⁵*New Eng. Jour. Med.* 1933, Aug. 10, 295; ⁶*Jour. Amer. Med. Assoc.* 1934, Jan. 6, 36.

SKIN, PYOGENIC INFECTIONS OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Superficial Staphylococcal Infections: Treatment by Staphylococcal Toxoid.—J. I. Connor and M. McKie¹ have been able to establish complete immunity in rabbits to staphylococcal toxin and to massive doses of living toxigenic staphylococci intravenously by a series of subcutaneous injections of living toxigenic staphylococci followed by injections of staphylococcal toxoid (formalized toxin). They find this immunity to be accompanied by a marked rise in the antitoxin content of the serum of the animals. They have examined the sera of 120 patients suffering from superficial staphylococcal infection, such as furunculosis and sycosis barbæ, and a comparison with normal sera shows this type of infection is accompanied by a slight but definite rise in the antitoxin content. This suggested that injections of toxoid in man might be of value in the treatment of superficial staphylococcal infection, in which the immunity response is inadequate.

The toxoid used by the authors is prepared from four strains of staphylococci. The toxin is prepared by the method described by Barnet² and is detoxicated by incubation for five days at 37° C. after the addition of 0.2 per cent formalin, and is then tested for toxicity by injection in the ear vein of a rabbit. If non-toxic, it is filled into vaccine bottles in 10-c.c. amounts, and stored on ice pending its use in treatment.

Treatment was begun with 0.05 c.c. of concentrated toxoid, the dose being increased each week by 0.1 c.c. These injections desensitized the patient and were followed by injections of crude toxoid (maximum dose 2 c.c.). Individual reactions to the initial injections have been marked, and are apparently allergic in origin. All cases treated have shown a definite rise in titre when tested for anti-hæmolysin.

Cases of furunculosis usually respond to 6 or 8 injections of toxoid, but as they also respond to other forms of treatment, cases of sycosis, which are more resistant, have been tested. In 18 cases of sycosis, 10 cleared up completely and 4 have much improved.

The authors point out that the whole question of immunity is involved and many factors probably come into play: (1) The pathogenicity of the infecting organism, of which toxicity is only one factor; (2) The general and local

immunity of the patient and his response to toxoid and other protein constituents of the crude product; and (3) The question, in the very superficial infection, as to how much the superficial epidermic structures share in the general immunity.

D. J. Kindel and M. J. Costello³ have treated 28 cases of acne vulgaris, 6 of furunculosis, and 8 of syccosis with staphylococcal toxoid. Of the acne cases, 22 were pustular and 6 papular; of the 22 pustular cases, 3 were slightly improved, 11 unimproved, and 8 worse. In the syccosis cases all the patients were unimproved or worse. Of the 6 cases of furunculosis, 3 cleared up rapidly, while 3 showed no improvement. The authors conclude that, though the series of cases is small, the results appeared to be so definitely unsatisfactory that continuation of this method of treatment seemed unwarranted.

Erysipelas.—E. Neuber⁴ describes the treatment of patients suffering from erysipelas by injections of the serum obtained from patients convalescent from the same disease. The serum was obtained from patients who were free from tuberculosis and syphilis and had been afebrile for four to five days. Thirty-six patients were treated by injection of from 10 to 40 c.c. according to age and other factors. A few patients received only one injection, most two; only in two cases were more required, one receiving 100 c.c. in all, and the other 220 c.c. This last case was the only fatal case in the series of 36. The author believes the method a safe and rapid means of dealing with this disease.

REFERENCES.—¹*Brit. Jour. Dermatol. and Syph.* 1934, Jan., 20; ²*Jour. Pathol. and Bacteriol.* 1931, xxxv, 477; ³*Jour. Amer. Med. Assoc.* 1934, April 21, 1287; ⁴*Wien. klin. Woch.* 1934, Jan. 12, 40.

SKIN, TUBERCULOSIS OF. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Primary Infection in the Skin.—E. Bruusgaard¹ calls attention to a rare form of primary tuberculous infection of the skin (*Plates XLIII, XLIV*). He describes three cases, all in children, which showed a characteristic sore or tuberculous chancre. This is characterized by a sharply circumscribed and definitely raised infiltrated lesion of a peculiar elastic consistency with deep central necrosis. Fine granulations were seen after removal of the crust and a slightly undermined wall-like bordering edge was present. Following the primary sore was a rapidly developing and extensive swelling of the regional glands, with softening and perforation. The process spread, giving rise to enlargement of other glands. The clinical picture was so like that of a syphilitic sore with lymphadenitis that a search for spirochaetes was considered necessary.

The author points out that this method of infection is very rare, but that in the cases he describes he was unable to demonstrate the existence of any previous infection by the tubercle bacillus, and believes these cases to be true examples of a 'primary complex' of tuberculosis in the skin.

Lupus Vulgaris.—

TREATMENT.—S. Lomholt² gives a survey of the lines of treatment adopted for lupus vulgaris at the Finsen Institute, of which he is the Director. He discusses two methods of *general treatment*: (1) Dietetic; and (2) Light baths. As regards *dietetic treatment*, he has not found much improvement with the Gerson-Hermannsdorffer-Sauerbruck method, but considers that a supplementary diet rich in vitamins, in addition to the ordinary diet, is of value, especially in cases where the lupus is extensive and the patients are debilitated. He advocates the addition of 50 grm. of butter, two carrots, two tablespoonfuls of wheat germ, and the juice of a lemon to the diet. With this he has obtained a considerably greater increase of weight in his patients than usual.

PLATE XLIII

TUBERCULOSIS OF THE SKIN

(B. BRUSGAARD)



Tuberculous sore at the angle of the mouth. Swollen glands in submaxillary region and along sternomastoid.

*By kind permission of the
'British Journal of Dermatology and Syphilis'*

PLATE XLIV

TUBERCULOSIS OF THE SKIN—*continued.*

(E. BRUSGAARD)



Tuberculous lesion of right arm. Swollen glands above internal condyle and in axilla.

*By kind permission of the
'British Journal of Dermatology and Syphilis'*

As regards *light baths*, in recent years a new type of lamp, the universal lamp, in which pure carbons are replaced by Sieman's Schneeweisskohlen (white flame carbons) has been used at the Finsen Institute. These give an emission resembling sunlight considerably more closely than that of pure carbons. The carbons are placed almost parallel, so that the emission from both craters is utilized when the patients are irradiated in a horizontal position with the lamp suspended above them. With this lamp a much stronger erythema effect is obtained than with the older type of lamp, and the same or even better therapeutic effect is produced with a shorter time of exposure. The light bath is given daily or every other day in such initial doses as will produce a moderate erythema. The time of exposure is increased gradually from day to day up to one hour as a maximum, care being taken to avoid a strong erythema. The treatment is continued for three months at the most, after which there should be a pause of about one month. In favourable cases complete recovery may be obtained by treatment with carbon-arc baths alone.

Local treatment, however, is the most important form of therapy, and comprises several methods:—

1. *Surgical removal* is very successful in small lupus lesions. The excision must also include a zone of normal tissue.

2. *Electrocoagulation* may be carried out either by compact destruction of the entire lesion, or by excision with a knife-shaped electrode. By either method the scars are not so neat as after excision or by local light therapy.

3. *Scarification* is an older method chiefly recommended in France. In the author's opinion it does not appear very effective.

4. *Chemical caustics* are able to remove the main part of the lupus tissue, but complete recovery is rare. Massive scar production is also frequent. The most successful caustic is *pyrogallie acid*, which has an elective caustic effect on tuberculous granulation tissue. It is best employed in the following formula: Vaseline 11 parts, pyrogallie acid 3, salicylic acid 3, resorcin 3. The ointment is smeared on a piece of lint cut to fit the plaque to be treated, and fastened by a bandage. The dressing is changed night and morning and each time as much of the destroyed tissue as possible is cautiously removed. The treatment is rather painful and, as a rule, only tolerated for a few days at a time. When it is discontinued it is replaced by an indifferent soft ointment or a compress of 0.2 per cent resorcin solution. Corrosive treatment is valuable in dealing with the verrucose form of lupus as a preliminary to light treatment.

5. *Local light treatment* is the main form of local treatment used at the Finsen Institute. The author considers treatment by the Kromayer mercury-vapour lamp, though easier to apply, considerably inferior to the Finsen treatment. The Finsen-Lomholt lamp is now exclusively used at the Finsen Institute. It has the advantage of being worked automatically, so that one nurse can operate three lamps at a time. The lamp is also considerably more effective than the original model. Its main points are: (a) A carbon arc lamp of 20 to 30 amperes, with automatic regulation, and with the positive upper carbon in the horizontal and the negative carbon in the vertical position. (b) A concentration apparatus of (i) a strong plano-convex front lens (focal distance about 10 cm.), (ii) a large quartz cylinder, the ends of which are formed by two plano-convex lenses melted into the walls of the cylinder, the cylinder being filled with a watery solution of cobalt sulphate (red), and (iii) a cuvette filled with a blue solution of copper sulphate in strong ammonia, a strong plano-convex quartz lens forming the front side of the cuvette. (c) A number of quartz tubes of different shapes, to be used for the compression of the lupus patch during the treatment. Using this lamp a field from 3300 to 3600 Å.U. is obtained.

Before giving treatment the lupus lesion must be carefully cleaned to remove scales, crusts, and the remnants of ointment, but avoiding any bleeding. The compression apparatus is adjusted to give a firm, fairly strong pressure, so as to cause an effective local anæmia. This need never be painful; only in rare cases with extensive open lesions is it necessary to employ some local anæsthetic. The treatment must be given in an orderly manner, beginning at one side of the lesion and proceeding systematically until the whole plaque has been treated completely. To obtain rapid healing it is important to carry through a suitable treatment for the reactions that appear after irradiation. Compresses of 0.2 per cent resorcin solution are used, and changed three times daily. In lupus of recent origin five to seven series of irradiations are given, with an interval of eight to fourteen days, as a first treatment. Each series consists of a number of exposures lasting one hour and covering an area about as big as a shilling until the whole patch has been irradiated. This will in most cases give complete recovery. It cannot be too strongly emphasized how important it is to complete the treatment the first time. Where treatment has been only partly carried through, troublesome and persistent relapses occur.

Finally, the author gives a warning about the use of X rays and radium in lupus. They give good transient effects, but definite cure is rare, and the result after some years will generally become that of a disfiguring atrophy with telangiectasia, irregular pigmentation, and even ulceration, not to mention the marked tendency to malignant degeneration. Grenz rays seem to be less dangerous, but a definite cure seems equally difficult to obtain.

At the Finsen Institute during the last two years 150 fresh cases of lupus vulgaris have been treated. Apparent cure has been obtained in nearly 80 per cent of the cases. In the rest great improvement was obtained.

A. Rollier³ reiterates his views that the skin is the chief seat for the formation of immune bodies, and agrees with E. Hoffmann's teaching that the skin possesses the capacity for producing materials which exert a curative action in the event of infections. The remarkable results obtained at Leysin in the treatment of lupus by the use of *general exposure to the sun* with covering of the affected parts, confirm the correctness of his belief in the important part played by insulated skin in the struggle against infections. In old-standing lupus lesions treated for a long time by purely local treatment, the affected neighbouring tissues must be put at rest at the beginning of the cure, like an affected joint, while excluding a direct solar action. As soon as they recover their defensive power there follows improvement in the lupus lesions. Not until the cure is well advanced is local, in addition to general, heliotherapy employed. The technique and dosage are based on the following fundamental principles: Heliotherapy must be direct, i.e., applied upon the uncovered skin without interposition of glass or screens. It must be general, i.e., applied over the whole body; progressive and derivative, i.e., exposing the extremities. It must be carefully individualized, adapted to the climate where it is practised, regulated and dosed according to the reactions of the patient. Progressively associated, general and local treatment can be applied to cases of lupus or more recent origin where the tissues have not lost their vitality. Local heliotherapy requires the greatest care, and dosage should never exceed a few minutes at the start and should be gradually increased according to the patient's idiosyncrasies. In addition a nutritious diet and judicious psychotherapy play an important part in the treatment of lupus patients.

H. Semon and H. S. Burnett-Jones⁴ have treated a number of cases of lupus vulgaris with *tuberculin*, with favourable results. Old tuberculin (T.A.F.) and, at a later stage, tuberculin B.E. have alone been used. The primary dose depends upon the reactions to diagnostic intradermic and subcutaneous

injections of T.A.F., but appears to be in the neighbourhood of 0.000005 c.c. T.A.F. Doses are given twice weekly and subsequent doses depend on the general and focal reactions obtained.

R. Aitkin,⁵ commenting on the report of Semon and Burnett-Jones, points out that tuberculin had been employed at Edinburgh by Sir Norman Walker for some thirty years, with very satisfactory results, and that the treatment was only discontinued in 1926 when carbon arc lamps for general radiation were installed and all the lupus patients could be treated by this means.

REFERENCES.—¹*Brit. Jour. Dermatol. and Syph.* 1934, March, 113; ²*Brit. Med. Jour.* 1934, Aug. 18, 291; ³*Practitioner*, 1934, Feb., 146; ⁴*Proc. Roy. Soc. Med. (Sect. Dermatol.)*, 1934, Jan., 287, and *Brit. Jour. Dermatol. and Syph.* 1934, Feb., 87; ⁵*Ibid.* May, 207.

SKIN-GRAFTING. (*See SURGICAL TECHNIQUE.*)

SLEEPING SICKNESS. (*See TRYPANOSOMIASIS.*)

SMALL-POX. (*See also VACCINATION.*) J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Report of the Health Section of the League of Nations,¹ the principal foci of small-pox in Africa during 1932 and the first six months of 1933 were Nigeria, where the disease was more prevalent in the northern than in the southern provinces; the Belgian Congo, where most of the cases were of the mild form; and Nyasaland. In Morocco an epidemic which had begun at the end of 1931 and reached its height in January, 1932, subsequently showed a decline as the result of an intensive vaccination campaign. In Egypt an outbreak occurred at Alexandria in November, 1932, and lasted till 1933, the fatality being 21.6 per cent. In Asia the principal foci in 1932-3 were British India, French India, Iraq, Persia, French Indo-China, China, Japan, and Soviet Russia. In Europe no cases were reported in Scotland, the Irish Free State, Denmark, Austria, Hungary, Czechoslovakia, Bulgaria, or Yugoslavia, and only sporadic cases occurred in France, Germany, Belgium, Italy, Poland, Norway, Finland, Roumania, and Greece. The most important foci in Europe in 1932 are still Soviet Russia, where 12,790 cases occurred; Spain, where there were 1005 cases seen, though 90 per cent were varioloid; Portugal, where there were 4226 cases with 1030 deaths; and England, where there were 2039 mild cases. In America small-pox showed a decrease in its incidence and fatality in 1932 and 1933. In Mexico the severe form still prevails and the number of deaths is relatively high. In Central America the incidence is irregular. In South America the incidence was very low in Colombia, low in Chili, Brazil, and the Argentine Republic, nil in Venezuela, but fairly high in Ecuador, Peru, and Bolivia. There were no cases in 1932 and the first nine months of 1933 in Australia, New Zealand, and the Pacific Islands.

Sir George Buchanan² states that the number of cases notified in England and Wales decidedly decreased in 1933, and the disease was tending to disappear from London and the South of England. No case of variola major had been introduced since the *Tuscania* incident in 1929 (*see MEDICAL ANNUAL*, 1930, p. 472), nor do the clinical features or fatality rate among unvaccinated persons indicate any increase in the gravity of the disease. There were 242 deaths among 79,780 cases notified during the period 1922-33, but it was impossible to state in how many cases small-pox was really the cause of the fatal issue among these fatal cases.

An outbreak³ of 25 cases of severe small-pox with 4 deaths occurred at Blackburn in January, 1934, and ended on March 15.

In a presidential address on the small-pox pandemic of 1870-4 J. D. Rolleston¹ stated that though the United Kingdom suffered severely, the incidence and fatality of the disease would have been considerably higher had it not been for the first Compulsory Vaccination Act for England and Wales passed in 1853. The pandemic arose in the north-west, north-east, and south-east of France in the last quarter of 1869, and then spread throughout the country and thence to England, Germany, and other European countries. The total number of deaths from small-pox in France during the epidemic was estimated as between 60,000 and 90,000. The incidence and fatality of small-pox were heavy among the civilian population of Germany as compared with the well vaccinated German army, but were lower in the Southern States, where primary vaccination was compulsory, than in Prussia and Saxony, which had no vaccination laws.

REFERENCES.—¹*Epid. Rep. Health Sect. League of Nat.* 1933, xii, 209; ²*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 52; ³*Ibid.* 574; ⁴*Proc. Roy. Soc. Med. (Sect. Epid.)* 1933-4, xxvii, 15.

SOMNIFAIN NARCOSIS IN THE PSYCHOSES. (See PSYCHOSES, SOMNIFAIN NARCOSIS IN.)

SPINA BIFIDA.

John Fraser, Ch.M., F.R.C.S.Ed.

Surgical literature has often expressed a pessimistic attitude towards operation for spina bifida, and there are many who believe that interference should be limited to cases of the pure meningocele type, in which the overlying skin is healthy and no evidence of nerve involvement exists. In other words, they would exclude from operation cases of the myelomeningocele type, a group which forms some 80 per cent of the total case numbers. A. Kolodny¹ has expressed a more hopeful view. Reporting his results in 79 cases, he intimates that it is his practice to operate on every case whatever its type, the only contra-indication being the general condition of the child. He does not regard the existence of paralysis as excluding operation; in fact he claims that it is only by the exercise of surgical interference that one can hope to achieve any degree of benefit in cases of this type.

The operation which he recommends follows the usually accepted lines. If nerve tissue is present in the sac, he makes no attempt to replace it within the vertebral canal, and in such cases he is satisfied with removal of the sac and repair of the defect, establishing for this purpose three layers—dura mater, deep fascia, and skin. If there should be difficulty in securing a fascial layer, he is satisfied with a dural and skin covering. He is averse to any complicated procedure which involves mobilization of the paravertebral muscles and the skeleton for the reasons that he does not regard such interference as necessary, while its employment greatly increases the shock, and therefore the risks of the operation.

The time of operation in spina bifida has always been a debated point. Kolodny advises that it should be delayed until the weight lost by the child after birth is regained—a matter of about two weeks—and that the operation should then be performed. In cases in which the skin covering is healthy and there is no evidence of the sac increasing in size, operation may be postponed until the end of the second month. If the skin is broken and there is escape of cerebrospinal fluid, he advises delay until the sinus is healed, and he adds that this is accomplished by protecting the wound with a strip of sterile silk so as not to disturb epithelization when the dressings are changed.

We confess that the optimism which this statement implies is in our experience rarely justified, for if a fistula is established its spontaneous closure is a rare

event. The author believes that the risks of post-operative hydrocephalus have been exaggerated, and that when the complication is encountered it has either been in existence before operation, or it has developed as a result of post-operative infection.

Of the 79 cases which form the basis of this article, 60 were submitted to operation, so that it would appear that 25 per cent were regarded as unsuitable for surgery—a more strict degree of discrimination than the main theme would seem to imply. The mortality figure was remarkably good, 5 per cent; the 3 cases which succumbed were examples of the myelomeningocele type.

H. Keller² has contributed a long paper on spina bifida occulta, embodying the observations which he has made on Jewish and Arabian children in the Near East (Jerusalem). The conclusion he has come to as the result of his observations is that for some obscure reason the error is comparatively common among these children, the Jews being more frequently affected than the Arabs. The figures given are 18.8 per cent in 276 Arabian children and 28.2 per cent in 258 Jewish children, and the males in both races appear to be more susceptible than the females. The author regards the error as a serious one, and in proof of this he points to the number of body deformities associated with it—extremity asymmetry, bow-legs, knock-knee, flat-foot, and various hip errors. Urinary incontinence, which the literature of the past decade has so frequently associated with spina bifida occulta, is not, in the author's opinion, a common association. He keeps an open mind upon the question of treatment; operation is recommended if there are evidences of nerve tissue involvement, but, failing this indication, he recommends that the part be protected by the wearing of a suitable belt or support.

The main interest of the paper is its record of what appears to be a relatively high percentage of a vertebral error in a selected group of individuals. One imagines that such an occurrence must have a genetic association, and the value of the paper would have been increased if this aspect of the question had been more fully investigated.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, Nov. 18, 1626; ²*Med. Record*, 1934, May 2, 445.

SPINE, TUBERCULOUS DISEASE OF. *E. W. Hey Groves, M.S., F.R.C.S.*

K. H. Pridie, F.R.C.S.

TREATMENT.—In this matter the general trend of surgical opinion has been in favour of conservative rather than operative methods. Although the fixation operations of Albee and Hibbs are still practised successfully, there is a tendency to limit the class of cases for which these operations are applied to adults with disease limited to one or two vertebral bodies.

Two recent proposals have been made, of widely different character—one conservative and the other radical. K. H. Pridie¹ suggests that children with tuberculous spines should be treated by *immobilization in a prone position*. His arguments are that this position, whilst preventing any flexion or lateral movement of the spine, allows some degree of hyperextension of the whole back and in particular it permits of the head and neck being raised. This promotes muscular development in the erector spine group of muscles instead of leading to atrophy, as fixation in the usual supine position necessarily does. By maintaining and increasing the strength of the back muscles, later treatment when the child is allowed up is greatly facilitated, and a spinal brace can often be dispensed with. The method is as follows:—

The child is placed on an orthopaedic table with the back hyperextended. The front of the abdomen and thighs are coated with zinc ointment and castor oil. A plaster case is then made and moulded on to the anterior and lateral

surfaces of the body and legs from the top of the sternum down to the middle of the lower legs. The cast is removed, polished and varnished, and is subsequently worn without any padding. The cast is fixed to the ordinary bed-frame, and the child tied into it by bandages which encircle the abdomen and thighs (*Plate XLV*). When the disease has become quiescent the child is removed from the cast and is made to lie on an inclined pillow which may be incorporated with a wooden frame (*Fig. 44*). After about three months, if the disease shows no signs of re-activation, walking is started with the aid of a wicker basket, so constructed as to make it impossible for the child to fall (*Fig. 45*).

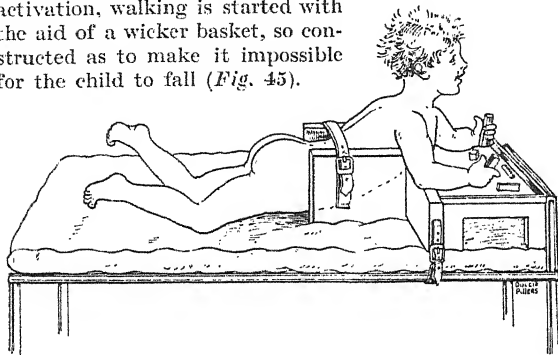


Fig. 44.—Child in the second stage of treatment, lying prone on a wedge-shaped cushion in a frame.



Fig. 45.—Third stage of treatment. Child walking in a wicker basket.

(By kind permission of the 'Medical Press and Circular'.)

Three Japanese surgeons, H. Ito, J. Tsuchiya, and G. Asami², have introduced a daring innovation which, in spite of their 10 reported successes, is not likely to be widely adopted. They aim at nothing less than a radical removal of the diseased vertebral body with the fixation by a bone-graft either at the time or at a subsequent operation.

The lumbar vertebræ are approached through a pararectal incision and an extraperitoneal route. The dorsal vertebræ are dealt with by a costo-transversectomy of at least three segments. Any abscess

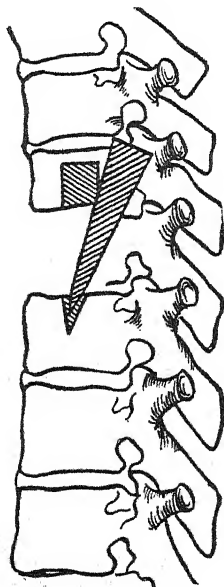


Fig. 46.—Schematic drawing to show the direct method of bone transplantation.—(Reproduced from the 'Journal of Bone and Joint Surgery'.)

met with is aspirated in the course of the operation. When the carious vertebral body has been exposed, all its diseased part is removed by sharp spoon or, if necessary, by chisel. A bone-graft taken from a rib or tibia is then inserted between the vertebral bodies above and below the lesion (*Fig. 46*). Or if it should be undesirable to prolong the operation, the bone-grafting is deferred to a later date, and then will be the ordinary posterior Albee graft. In all except 2 of the reported 10 cases healing was

PLATE XLV

TUBERCULOSIS OF THE SPINE

(K. H. PRIDIE)

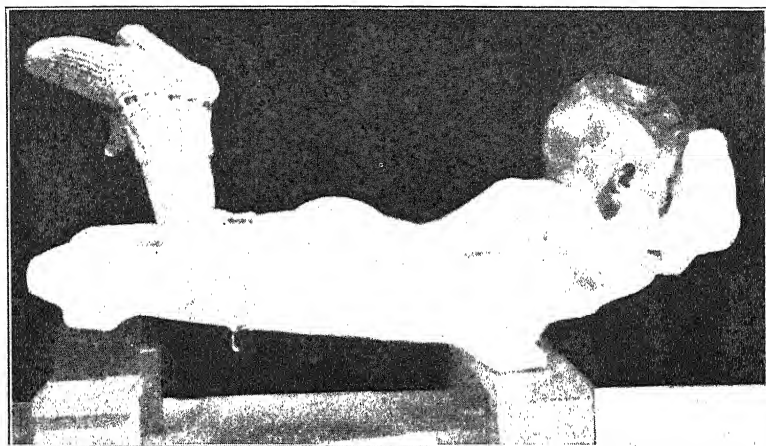


Fig. A.—Child in plaster bed with head rest for a lesion in the mid-dorsal region.

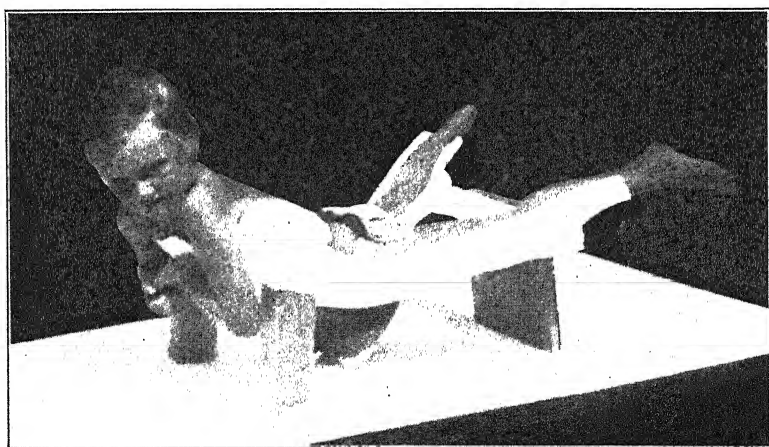


Fig. B.—Another view of a child in a plaster bed.

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by first intention. In one case a fistula formed but closed spontaneously, and in the other there was evidence that the fistula was about to heal. All the patients were adults, the youngest being 18 years. The earliest case was done fifteen months before the date of the report.

REFERENCES.—¹*Med. Press and Circ.* 1934, March 21, 256; ²*Jour. Bone and Joint Surg.* 1934, xvi, July, 499.

SPIROCHÆTOSIS ICTEROHÆMORRHAGICA. (See JAUNDICE, INFECTIVE.)

SPLEEN, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

A. J. Walton,¹ writing for an American journal, gives an illuminating account of the perverted physiology of the spleen giving rise to conditions which may be benefited by surgical treatment. According to the physiologist, the spleen acts as a reservoir storing up blood in readiness for an emergency. It may therefore store up blood parasites, and he relates a case in which a man of 46 who had had malaria over thirty years before developed a big spleen; it was removed, and shortly afterwards malarial parasites appeared in the blood and there were two ague fits. These were treated, and never recurred. Evidently the spleen had stored parasites, some of which were expressed during the splenectomy. The spleen, further, should destroy red blood-corpuscles; in polycythæmia it fails to do so, but operation is not indicated. In splenic anæmia it is too active, and removal is beneficial, but there is often some association with cirrhosis of the liver, and it may be difficult to tell which is primary, the cirrhosis or the splenic disorder. If the liver is at fault, splenectomy does little or no good. The spleen, further, catches and destroys abnormal red cells, and is active in this regard in pernicious anæmia, where owing to the absence of a gastric ferment the appropriate stimulus for the formation of normal red cells is lacking and abnormal reds are turned out instead, which the spleen destroys. Happily, there is a medical cure, so splenectomy is seldom necessary. In acholuric jaundice the patient is born with abnormally fragile red corpuscles which the spleen apparently dislikes, distrusts, and destroys, causing anæmia and jaundice; splenectomy cures the disease, but the fragility of the corpuscles remains. In thrombocytopenia (purpura hæmorrhagica) the platelets are injured, probably by a toxæmia at first active, then latent, and the spleen destroys them. The loss of the platelets gives rise to purpura and hæmorrhage, associated with: (1) a low platelet count, (2) normal clotting time, (3) prolonged bleeding time, (4) the clot will not retract, and (5) petechiæ appear beneath a tourniquet. The condition must not be confused with hæmophilia, in which the platelets are normal but the clotting time is prolonged. Splenectomy during the early acute toxæmic stage is dangerous; in the later stages when the spleen is enlarged as a result and a proof of its overactivity, it is safe and curative. If the leucocyte count is low, it signifies the oncoming of an aplastic anæmia and the risks are increased. The spleen may enlarge in certain general metabolic disorders, such as Gaucher's disease, Niemann-Pick disease, and hypercholesterinæmia, which are closely related. Splenectomy may relieve local pain, but is not curative, nor is it indicated for the leukaemias, lymphadenoma, or lymphosarcoma.

R. Maingot,² of the Royal Waterloo Hospital, also writing in an American journal, discusses the technique of splenectomy. The stomach should be kept empty of gas by passing a tube and leaving it in. He prefers the linea alba incision when operating for ruptured spleen, the vertical incision through the rectus as a routine, and the subcostal (left-sided Kocher) in obese patients. Adhesions are then separated, and any accessory spleens looked for and removed

(except in trauma cases), as they are capable of growing as large as a normal spleen and might reproduce the disease. In easy cases the lower two-thirds of the gastrosplenic omentum is then transfixed and ligatured off close to the spleen and away from the stomach. Then the posterior leaf of the lienorenal ligament is divided and the spleen freed and brought out; the rest of the gastrosplenic omentum is dealt with, the tail of the pancreas separated, and the splenic vessels caught and divided by Federoff's three-clamp method. The tail of the pancreas, and the stomach, must be seen and kept out of danger. The pedicle is tied *en masse* and also vessel by vessel (*Plates XLVI, XLVII*).

In difficult cases, with a large or adherent spleen, the big individual vessels in the gastrosplenic omentum must be picked up and tied one by one. The branches of the splenic artery, too, must be ligatured with stout floss silk, one by one, in two places fully half an inch apart, and cut between them. The veins are very large and very friable. The three-clamp method is not suitable. Three pints of warm normal saline are left in the abdomen.

W. D. Wise,³ of Baltimore, advises that a rubber-covered clamp be applied for a few minutes to the whole pedicle, including the stomach and tail of the pancreas, while the vessels are looked for and ligatured.

REFERENCES.—¹*Ann. of Surg.* 1933, Sept., 379; ²*Surg. Gynecol. and Obst.* 1934, Jan., 62; ³*Ann. of Surg.* 1934, May, 875.

SPLENIC ANÆMIA. (*See BLOOD DISEASES.*)

SQUINT.

Sir Stewart Duke-Elder, M.D., F.R.C.S.

Treatment of Non-paralytic Squint.—In a previous issue (*MEDICAL ANNUAL*, 1932, p. 495) a résumé was given of the more modern methods of dealing with cases of squint in this country. An interesting paper by L. C. Peter¹ on the same subject is of importance in corroborating the views expressed therein, especially in the stress laid upon early orthoptic treatment and early operation.

The treatment of non-paralytic squint should be begun as soon as the diagnosis is made; if this is done the prognosis is good, although a perfect cure may be prevented by: (1) total absence of the fusion faculty, and (2) central amblyopia found in the squinting eye. All types of treatment yield the best results before the age of six. It is disastrous to delay treatment until the child is of school age.

The first and most important step in the treatment is refraction. Full correction should be prescribed at the earliest possible moment, and throughout the period of treatment and after the condition has been cured the patient should be examined at least once a year. A full correction, but not an over-correction, should be worn, and in children about two years of age the maximum correction obtainable by glasses will be effected within a month. Little improvement can be expected beyond that noted at the end of from four to six weeks.

The most important feature in the treatment is the prevention of the development of amblyopia in the squinting eye. It occurs in young children, and rarely after the seventh year. If no effort is made to correct amblyopia in early childhood the condition becomes permanent. The method used to prevent and correct amblyopia are:—

1. The introduction of atropine into the fixing eye and the use of an occlusive bandage. Before the development of amblyopia, a two-hour session with the bandage daily is sufficient. After its development, the use of the bandage for from three to six hours daily is advisable. [The reviewer, on the other hand, considers it essentially important that, when amblyopia has developed, the

PLATE XLI—SPLENECTOMY

(R. MAINGOT)

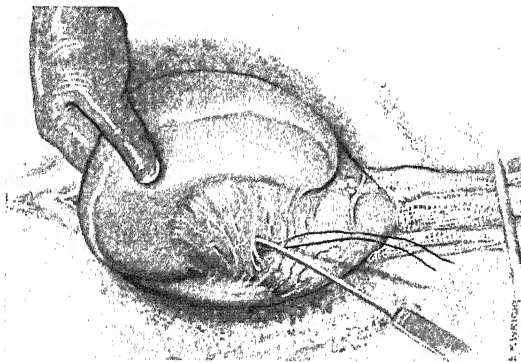


Fig. A.—Gastrosplenic omentum displayed. Ligation of the blood-vessels in the gastrosplenic omentum.

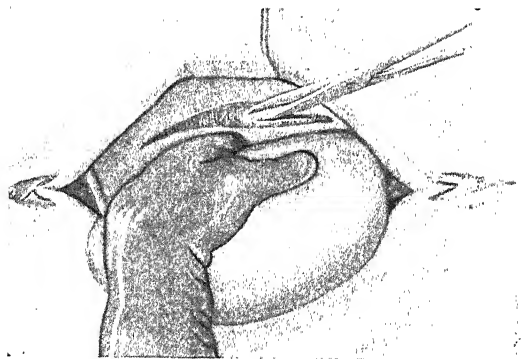


Fig. B.—Mobilization of the spleen by division of the posterior leaf of the lienorenal ligament.

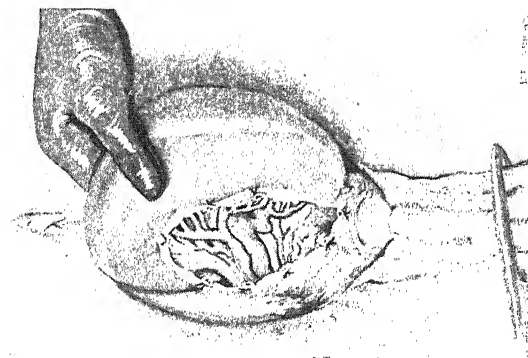


Fig. C.—The gastrosplenic omentum has been ligatured, and the blood-vessels in the lienorenal ligament are shown.

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PLATE XLVII—SPLENECTOMY, continued

(R. MAINGOT)

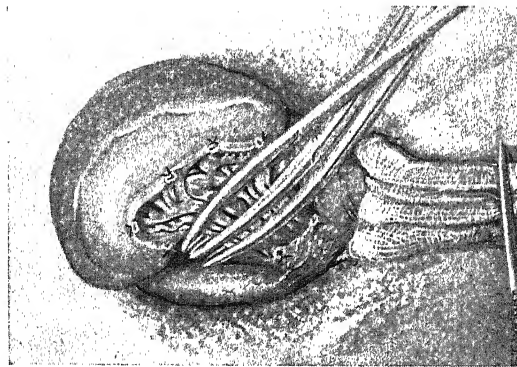


Fig. D.—The three-clamp method of Fédérecf for dealing with the pedicle.

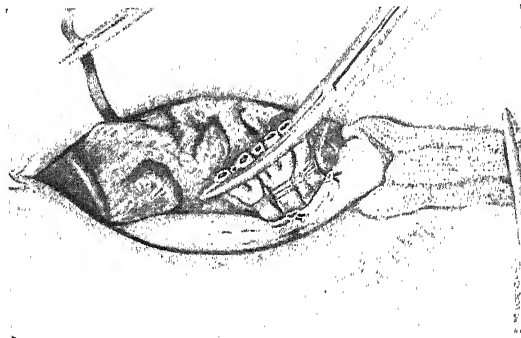


Fig. E.—The crushed grooved area which is left after the removal of the medial hemostat is shown ready for the application of the ligatures.

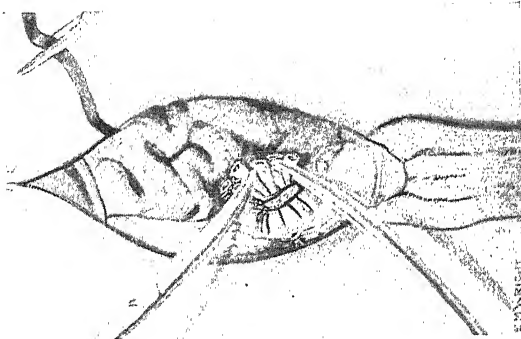


Fig. F.—Two stout ligatures are applied to the crushed groove, and the individual blood-vessels distal to this are ligatured off separately. Note the position of the Cripps' pad.

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good eye should be *constantly* occluded until good vision is established; the development of amblyopia is an active repression of the vision of one eye in the interests of single vision, and if the two eyes are uncovered for any length of time daily, this active suppression tends to neutralize and more than neutralize the good effect of the stimulation due to occlusion of the good eye.—S. D.-E.]

2. Accommodation at the near point. This should be begun as early as possible.

As probably 50 per cent of cases come to operation largely because of inadequate training before the fifth year, there are four reasons why surgery should be done :—

1. Refraction and amblyopic training will yield maximum results in from one to six months.

2. In young children an advancement and recession operation usually reduces the deviation to an angle which fusion is able to bridge over. In older children and in adults, 35° of squint usually calls for a later operation on the fixing eye.

3. Strenuous efforts are necessary to prevent amblyopia up to the seventh year so long as squint exists.

4. Surgical treatment given at an early age brings about single binocular vision before school years begin.

Operation may be postponed because of: (1) protest of the parents, (2) the state of the child's health, (3) the hope that the eyes will eventually become straight, and (4) the danger that the eyes may become exophoric and eventually exotropic if the squint is corrected too early by operation. This does not occur if the surgical technique is accurate and fusion is trained.

Uncontrolled tenotomies have been replaced by some form of recession suture. However, the majority of surgeons believe it is better to shorten the weak external rectus because of the danger of weak convergence after a recession operation. The shortening operations are: (1) recession, (2) advancement, (3) tucking, and (4) the O'Connor cinch operation. In squint from 12° to 15° recession is best. Worth's technique is probably most satisfactory cosmetically. In squint of more than 15° advancement is best. Deviations beyond 20° and sometimes deviations even less than that require a supplementary procedure, either double advancement at separate sessions or advancement at one session and a recession suture on the opposing internus at another session. If two operations are needed and amblyopia is absent or can be corrected, double advancements are better than an advancement and recession. The value of tucking is debatable. This procedure should be used in phorias and only in squint of low degree (7° or 8°). Squint of 10° or more requires recession. The O'Connor cinch operation compares favourably with advancement and recession as regards results, but is followed by slow convalescence and a severe reaction. In a wide deviation (from 35° to 40°) advancement and recession on the squinting eye should be followed by the necessary supplementary procedures on the fixing eye carried out about two weeks later.

Classification of Cases.—An interesting paper is contributed by M. A. Pugh² on the etiology of strabismus. She divides cases of squint into four categories. The first group includes the patients with a definite refractive error who are much improved with their glasses and are unstable without them. They may have very poor or fairly good binocular vision, but the main factor appears to be the ametropia. The second group includes the cases of early onset in which the fusion faculty is very defective. These cases may have refractive errors, but they give the impression of having no idea of using both eyes together, and their glasses do not make such a marked difference as in Group 1 cases. The third group includes cases which may have a refractive error or may be emmetropic; they may have poor binocular vision or good

stereoscopic vision, but they will give a history of having maintained straight eyes until some psychological disturbance gave rise to nervous instability which manifested itself as a squint. The fourth group, where some physical defect is present, does not present difficulties in diagnosis, but sometimes insuperable difficulties in training. An analysis of 500 cases gave the following results :—

	Per Cent
1. Refractive error squints ..	62
2. Fusion defect squints ..	15
3. Psychological squints ..	21
4. Physical defect squints ..	2

1. *Refractive Error Squints*.—The squint may be either unilateral or alternating. In treating a unilateral squint, the vision in either eye must be equalized by occlusion and the squint is often converted into the alternating type in young patients.

The treatment of election in these cases, after the vision has been equalized as much as is practicable, is to develop firm fusion and stereoscopic vision by orthoptic exercises. If a patient with an alternating squint of a high degree is taught by orthoptic exercises to fuse at the angle of deviation before operative measures put the eyes straight, the ultimate result tends to be much better than in an untrained case. The images are fused and the depth value of the objects around is appreciated. The eyes in this case will probably remain straight and controlled during all movements. Where no training has been undertaken before the operation the patient may, in fortunate cases, learn to fuse by his own efforts, but more often the images confuse him and he inclines to recover some degree of deviation of his visual axes in order to alternate again. In all these cases glasses are essential; if such a case is put straight by an operation, the best correcting lens is that which gives the best vision with fusion at zero in distant vision.

2. *Fusion Defect Squints*.—In this type of strabismus one of three conditions results; diplopia, suppression of the image in one eye, or false projection. While fairly common at the onset of the condition, few cases retain a constant true diplopia; some of them avoid the confusion of this symptom by suppression. If the suppression is confined to one eye, the eye becomes more or less amblyopic; if either eye is suppressed when the other eye is functioning, an alternation of fixation occurs. The larger proportion of cases develop a false projection—not a false macula, but a false localization of an object seen by either eye. In this event, largely by means of a cerebral mechanism, the spot on the retina of the diverging eye which corresponds in position to the macula of the fixing eye appears to develop a special localizing power in conjunction with the opposite macula. It has very little more visual acuity than the surrounding retina and very much less than the true macula. Of the three states, diplopia is the most favourable from the point of view of treatment, and unless the squint is a large one, the patient is easily trained to fuse the images on the orthoptic instruments and later does the same with surrounding objects, thereby straightening his eyes. If an operation is now performed, no difficulty arises; the patient will fuse his images with very little training and will readily correct any residual deviation. The cases of suppression are more difficult, but if treated by occlusion before the eye is irrevocably amblyopic, the patients usually can be trained to develop a diplopia and can be treated from that point as above. False projection gives rise to difficulties in straightening squinting eyes by any method. A patient with 20° of false projection who has his eyes put straight by surgical measures will complain of diplopia as soon as the bandages are removed. This is usually a 'false diplopia', as his images are falling on each macula simultaneously, but he projects them 20° away from

each other. This is a very stubborn condition and does not seem to correct itself easily with training. The patient tries to fuse the images, and to do so turns the eye back towards the original position of squint, and many of the disappointing results of operation are due to this state of the binocular vision. Where there is a fixed false projection the best procedure is to try to develop true projection and fusion by training, and then to operate. Training in an alternating case with a fixed false projection is very tedious unless the treatment is aided by surgical interference. In this group the accommodation-convergence link is of very secondary value, and spectacles cannot be adjusted to be of use in lessening the deviation as in the 'refractive error' squints.

3. *Psychological Squints*.—This type of squint frequently occurs in emmetropic patients and may occur early or relatively late in life; the onset of a squint after eight years of age, unless there is a definite physical cause, suggests the probability of a psychological basis. The author estimates them as comprising 20 per cent of all cases of squint, and an analysis of 103 such cases gave the following results.

Imitative squints (7 per cent): These patients gave a history of imitating a beloved parent or friend, or an envied person. In one pair of brothers both squinted, the elder one had a large refractive error, and the young one was emmetropic. The young one squinted a week after the elder one.

Jealousy squint (10 per cent): A frequent cause is the advent of a new baby. The elder child will mope and be unhappy and will suddenly squint. The squint may be constant or only occasional, the stimulus being a wish to bring the focus of attention back to the patient.

Fear or shock squints (26 per cent): The squint in this group often develops as a direct result of trauma. A child who was frightened at night by a drunken father woke up the following morning with a marked and constant squint.

Difficult children (28 per cent): Ten of these were left-handed, while the others were of that self-willed type that the psychologist associates with left-handedness. Four of the cases also stammered.

Psychoneurotic parents (29 per cent): In these cases the home conditions allowed no peace or liberty for the child to develop a balanced psychological background. One child squinted whenever the father corrected her—the father being an irritable person with very evident psychoneurotic symptoms.

4. *Physical Defect Squints*.—Into this group fall those cases in which the squinting eye is irrevocably amblyopic, either congenitally or as the result of injury or disease. In these cases orthoptic exercises are useless and a cosmetic operation only can be done.

REFERENCES.—¹*Amer. Jour. Ophthalmol.* 1933, xvi, 481 (see also J. M. Bickerton, *Med. Jour. Australia*, 1933, ii, 569, M. Hine, *Brit. Med. Jour.* 1934, i, 329); ²*Brit. Jour. Ophthalmol.* 1934, xviii, 446.

STAPHYLOCOCCUS INFECTIONS. (See also SKIN, PYOGENIC INFECTIONS OF.)

SYMPTOMS AND COMPLICATIONS.—According to P. L. Honoré,¹ who reports a personal case, subacute *osteo-articular metastases* are a rare occurrence in staphylococcus septicæmia, and may not develop until several weeks after the onset. They are manifested by a fresh rise in temperature and local signs. The diagnosis can only be made by a blood culture. In Honoré's case, which was that of a boy aged 8 years, suppurative arthritis of the right elbow and hip occurred in the course of staphylococcus septicæmia. Operation was followed by complete recovery.

Several examples have recently been reported of *staphylococcal hepatic abscess*. The case recorded by M. Labbé, R. Boulin, and G. Dreyfus² was

that of a previously healthy youth, aged 18, who suddenly developed a swinging temperature and tenderness over the liver. Staphylococci were found in the blood culture, and on laparotomy a large solitary hepatic abscess was discovered from which staphylococci were cultivated. Death occurred a month later. The patient had never had amœbic dysentery, and examination of the stools was negative. P. Carnot and R. Cachera³ describe a similar case in a woman, aged 42, with no previous history of amœbic dysentery, who suddenly developed a large staphylococcal abscess in the outer part of the right lobe of the liver. The diagnosis was made by exploratory puncture, and the exact position of the abscess was determined by injection of air and lipiodol. Recovery followed evacuation of the abscess. No source for the staphylococcal infection could be discovered. P. Carnot and J. Caroli⁴ also report the case of a man, aged 53, who a week after cholecystectomy for gallstones developed two large staphylococcal abscesses in the liver as well as suppurative staphylococcal parotitis. The source of infection in this case was a carbuncle of the neck which had developed before the cholecystectomy. Evacuation of the hepatic abscess was followed by recovery.

REFERENCES.—¹*Thèse de Paris*, 1934, No. 322; ²*Bull. et Mém. Soc. méd. Hôp. de Paris*, 1934, lviii, 574; ³*Ibid.* 756; ⁴*Ibid.* 760.

STEATORRHEA, IDIOPATHIC. *Robert Hutchison, M.D., F.R.C.P.*

This subject was dealt with fully in the MEDICAL ANNUAL for 1933 (p. 444). A. M. Snell and J. D. Camp¹ describe seven additional cases seen at the Mayo Clinic. They doubt whether there is enough evidence to justify the condition being regarded as a clinical entity. The clinical syndrome of idiopathic steatorrhea with tetany may be produced by inflammatory or atrophic lesions of the upper intestinal segments. The defective absorption of fat, minerals, and vitamins may be secondary to such lesions.

J. H. Pratt² has made a study of steatorrhea in general based upon an estimate of the fat-content of the feces in 33 cases. Most of these were due to obstructive jaundice, obstruction of the pancreatic duct, or sprue; only 3 cases were 'idiopathic'. When the fat loss was due to absence of bile from the intestine the absorption of nitrogen was normal, but it is interfered with in obstruction of the pancreatic duct. In sprue it is usually normal but may be disturbed.

TREATMENT.—Snell and Camp advise treatment of the idiopathic cases on the same lines as tropical sprue: (1) Rest of the alimentary tract; (2) Restoration of the blood to normal; (3) Supplying demonstrable deficiencies such as diminution of calcium and phosphorus in the blood or of HCl in the gastric juice. Diet is of the first importance. In some cases a low-fat and high-protein diet answers, but fat tolerance is very variable and must be determined for each case. The same is true of tolerance for carbohydrate. Vitamin D in the form of viosterol is of great value. They have had only a limited experience of the use of liver extract for the anemia of the disease. Marmite has been recommended for it. They regard the results of treatment as on the whole satisfactory, but each case must be studied individually, and the co-operation of the patient is essential.

REFERENCES.—¹*Arch. of Internal Med.* 1934, April, 615; ²*Amer. Jour. Med. Sci.* 1934, Feb., 222.

STOMACH, CARCINOMA OF. *A. Rendle Short, M.D., F.R.C.S.*

The Tragedy of Gastric Carcinoma.—A somewhat gloomy but well-written article bearing this title comes from New Orleans, by U. Maes, F. F. Boyce, and E. M. McFetridge.¹ During ten years, 1922-31, there were 758 patients in their hospital suffering from cancer of the stomach, but out of every

100 cases only 30 were thought suitable for operation. The cancer was removed by partial gastrectomy in 8 per cent, and of these half died—that is to say, only 4 out of 100 patients left hospital with their growth taken away; how many of these recurred is unknown. As the authors remark, it is a tragic record, and probably it is truer to the general run of facts than the statistics of special clinics like that of the Mayos, who receive a disproportionately large number of early and favourable cases. The authors admit that inexpert surgery may have been a factor leading to so poor a result, but they believe that most other general hospitals in big towns would have to tell the same tale. [Probably this is true in England also, though we hope and believe the figures may not be quite so bad. When it is the custom to give a blood transfusion the operation mortality is certainly less. The remedy is not more heroic surgery, but earlier diagnosis.—A. R. S.]

H. C. R. Darling,² of Sydney, says with truth that “probably there is no surgical malady for which the general practitioner can accomplish more than carcinoma of the stomach, for he must necessarily be the one to see these cases in their early stages.” And again, “It is far more important to ascertain the cause of a chronic dyspepsia in a middle-aged person than to treat it.” Discomfort in the epigastrium, which may or may not be related to food, anorexia, flatulence, or heartburn—these are the suspicious early signs; cachexia and tumour formation signify a neglected case. There is a type in which the first symptom is hunger-pain, but food does not entirely remove the discomfort; there is another type with symptoms of pyloric obstruction, causing massive vomiting. That earlier diagnosis is possible is clear from the figures given by F. H. Lahey and S. M. Jordan,³ who found that even in the cases where the growth could still be removed, there was a history of over six months’ duration in one-third of the cases. If a full investigation, including the barium meal, was made early, many more cases could be diagnosed in time for removal.

Relation to Gastric Ulcer.—G. Gömori,⁴ of Budapest, says that in Hungary the relation is fairly close. Of 64 cases of gastric ulcer and 26 cases of carcinoma, there were 6 in which quite definitely a cancer developed in an ulcer. Maes¹ and his fellow-workers at New Orleans say that in 25 per cent of their cancer cases there was a clear history of ulcer. The corollary is, of course, that ulcers should be excised.

Operative Treatment.—Lahey and Jordan³ find that spinal anaesthesia in this type of patient, where a long operation may be necessary, is disappointing, and even dangerous; a large dose may be required, it has to be high, and the anaesthesia may pass off too soon. They use a combination of avertin, intratracheal ethylenc, and regional anaesthesia. If the resection has to be carried far up towards the œsophagus, valuable additional room is gained by mobilizing the left lobe of the liver by cutting its avascular ligamentous attachment to the diaphragm. Like many other surgeons, Lahey advocates partial gastrectomy, if it is at all possible, rather than gastrojejunostomy, even if metastases have to be left behind; the relief afforded is much greater and lasts longer. He has a few cases alive and well from three to nine years after operation.

G. T. Pack and I. M. Scharnagel⁵ maintain that a gastrojejunostomy for irremovable cancer of the pylorus is much more valuable if the stomach is divided proximal to the growth and sewn up, so as to prevent the cancer from extending into the anastomosis, and also to put the growth at rest.

Total gastrectomy is too unpromising an operation to be regarded with favour by the more cautious type of surgeon; the mortality is about 50 per cent, and few of the patients live long. Lahey reports one who kept active for three and a half years. C. A. Roeder⁶ describes three personal cases and

gives a full bibliography; there appear to be 88 on record, with 44 deaths. The first was by Connor in Cincinnati in 1884, and the patient died on the table. The first successful case was Schlatter's in 1897. Roeder gives a description of his operative procedure. One of his patients survived and was well three months after.

REFERENCES.—¹*Ann. of Surg.* 1933, Oct., 619; ²*Med. Jour. of Australia.* 1933, June, 697; ³*New Eng. Jour. Med.* 1934, Jan., 59; ⁴*Surg. Gynecol. and Obst.* 1933, Oct., 439; ⁵*Jour. Amer. Med. Assoc.* 1934, June, 1838; ⁶*Ann. of Surg.* 1933, Aug., 221.

STOMACH, ULCER OF. (See GASTRIC AND DUODENAL ULCER.)

STOMACH, VARIOUS SURGICAL AFFECTIONS OF.

A. Rendle Short, M.D., F.R.C.S.

Adenomatous Polypi.—There is nothing pathognomonic in the history of patients with this disease; the general picture is like that of gastric carcinoma. The barium meal may show multiple rounded filling-defects, or may suggest cancer. Operation is advisable, because, as E. B. Benedict and A. W. Allen,¹ of Boston, have found, in nearly half the cases there is microscopic evidence of potential malignancy.

Gastric Syphilis.—J. T. Priestley and W. Walters,² of the Mayo Clinic, comment on the difficulty of deciding whether or not to take time for anti-syphilitic treatment in a patient with old syphilis and a deformed stomach as demonstrated by X rays, which might be gumma, which is rare, or cancer, which is common. If the patient is between twenty and fifty, with a history extending over two years or thereabouts, with dyspepsia but no nausea, cachexia, bleeding, obstruction symptoms, and no palpable mass, syphilis is probable. If the skiagram shows the stomach converted into a narrow tube with a smooth lumen, this is confirmed; the disease of the stomach appears more extensive than the symptoms would coincide with. Anti-syphilitic treatment should then be tried, and may give very happy results. But unless the indications are thus clear, operation is indicated.

Gastric Operations.—F. Lahey,³ of Boston, describes a *method for avoiding tension and kinking of the proximal loop of jejunum in the posterior Polya gastrectomy*. He divides the ligament of Treitz from its insertion in the jejunum up to its origin in the root of the mesentery, so that the whole of the proximal loop of jejunum can be mobilized and passed up through the slit in the transverse mesocolon. When the slit is closed, only the distal loop has to pass through it.

D. C. Balfour,⁴ of the Mayo Clinic, writes on *secondary obstruction following operations on the stomach*. This, fortunately, is rarely seen if the original surgical procedure was properly carried out. If it is certain that a good opening was obtained, one need not be alarmed for a few days; keeping the stomach empty and giving fluids intravenously will probably allow the difficulty to right itself. If vomiting persists, and all the fluids given by mouth can be recovered by a tube, it is necessary to operate again, usually between the tenth and twentieth days, though it is probable that a good deal of œdema will be found at that date. There is a curious phenomenon occasionally met with—a gastric retention coming on after about ten days—which can be permanently cured by thoroughly emptying the stomach. If a secondary operation has to be done after a primary gastrojejunostomy, it may be found that the obstruction is due to too long a proximal loop; in that event a jejuno-jejunostomy between the two loops is required. More often the trouble lies in the anastomosis itself, and it has to be undone. It is sometimes sufficient to pass a tube through the abdominal wall, through the anterior wall of the

stomach, into the distal loop of the jejunum by way of the anastomosis. It serves to straighten out the junction and to allow of fluid feeding. It is left for a week.

[There is a cause of gastric retention which I have seen on several occasions which Balfour does not mention, namely, adhesion of the anterior and posterior walls of the anastomosis. For many years I have been in the habit of inserting a strip of rubber dam, $1\frac{1}{2}$ to 2 in. long, running from the stomach to the distal loop, secured by one fine catgut stitch to the gastric mucosa. It serves to keep the passage open, and can do no harm. I have never had any trouble with gastric retention since adopting this device.—A. R. S.]

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1934, Jan., 796; ²*Ibid.* June, 1930; ³*Ibid.* 1933, Aug., 227; ⁴*Ann. of Surg.* 1933, Nov., 882.

STRABISMUS. (See SQUINT).

STREPTOCOCCUS INFECTIONS. J. D. Rolleston, M.D., F.R.C.P.

TREATMENT.—The value of Vincent's refined and concentrated antistreptococcal serum is emphasized by J. P. Weill,¹ who records 51 cases of various forms of streptococcal infection so treated with only two deaths among patients aged from 4 days to 65 years. The serum should be given subcutaneously, intramuscularly, or intravenously in large doses as soon as possible, and the injections should be continued until certainty of recovery is established.

P. Reliquet² also states that Vincent's serum produces the largest number of successful results in pure streptococcal septicæmia.

REFERENCES.—¹*Thèse de Paris*, 1933, No. 216; ²*Ibid.* No. 170.

SUBPHRENIC ABSCESS.

A. Rendle Short, M.D., F.R.C.S.

A. Ochsner and A. M. Graves¹ present a study of 3372 literature cases and of 50 more treated in their own hospital at New Orleans. They point out, what is well known, that the main causes are perforations of the stomach, duodenum, or appendix, and that the right posterior variety is the commonest. Subdiaphragmatic infection is seen a good deal more frequently than subdiaphragmatic abscess, because only in 30 per cent of the patients does infection go on to pus formation. One should not therefore be in too great a hurry to operate. Usually there has been a known infective process in the peritoneal cavity which has generally been operated upon; in a few (7 in 50 cases) the onset is insidious. When pus is formed there is as a rule persistent tenderness over it; in the case of the right posterior variety, this will be along the right twelfth rib. Elevation and immobility of the diaphragm is a valuable diagnostic sign. The use of the aspirating needle to locate the pus is condemned unless one can be sure that it will not traverse the pleural or peritoneal cavities, but one can avoid these by entering below the twelfth rib and going upwards and forwards. Often an exploratory operation is better. The results of surgical intervention are given as follows:—

	LITERATURE REPORTS		OWN SERIES	
	Cases	Death-rate	Cases	Death-rate
Transpleural drainage ..	305	Per cent 39	16	50
Transperitoneal drainage ..	307	35.5	12	41.6
Extraparitoneal drainage ..	189	21	22	13.6

The approach recommended for the right posterior abscess is by an incision over and parallel to the twelfth rib, under paravertebral block anaesthesia. The rib is resected in its whole length. A *transverse* incision (not along the lie of the rib) is made in the bed of the rib at the level of the spinous process of the first lumbar vertebra (*Plate XLVIII*). This traverses the diaphragm and opens up the infrahepatic space. The pus may then be sought with the aspirating needle and the abscess opened with the finger. The anterior abscesses can be approached and drained extraperitoneally by an incision in the anterior abdominal wall. [These are the methods I have followed for many years and thoroughly endorse.—A. R. S.].

G. Janz,² of Frankfurt, mentions a case in which the interval between the original infection and the development of the subphrenic abscess was as long as seven years. Of his 15 operated cases, only 1 died, of pulmonary embolism.

P. E. Trucsdale³ gives some interesting pictures of the lymphatic channels by which the infection travels that gives rise to subphrenic abscess.

REFERENCES.—¹*Ann. of Surg.* 1933, Dec., 961; ²*Arch. f. klin. Chir.* 1933, Dec., 482; ³*Ann. of Surg.* 1933, Nov., 846.

SUDECK'S DISEASE. (See BONE DECALCIFICATION.)

SUICIDE.

H. Devine, M.D., F.R.C.P.

D. A. MacErlean¹ observes that when one considers the serious social consequences that follow from acts of suicide, any knowledge of the causes underlying its promptings must be of interest to those engaged in the practice of medicine. Its consideration presents a difficult and intricate problem, the elucidation of which involves a study of the fundamental processes of life in all their intangible manifestations, for the human mind, unlike the human heart, cannot be observed directly. The phenomenon of suicide remains one of these unsolved mysteries of human nature.

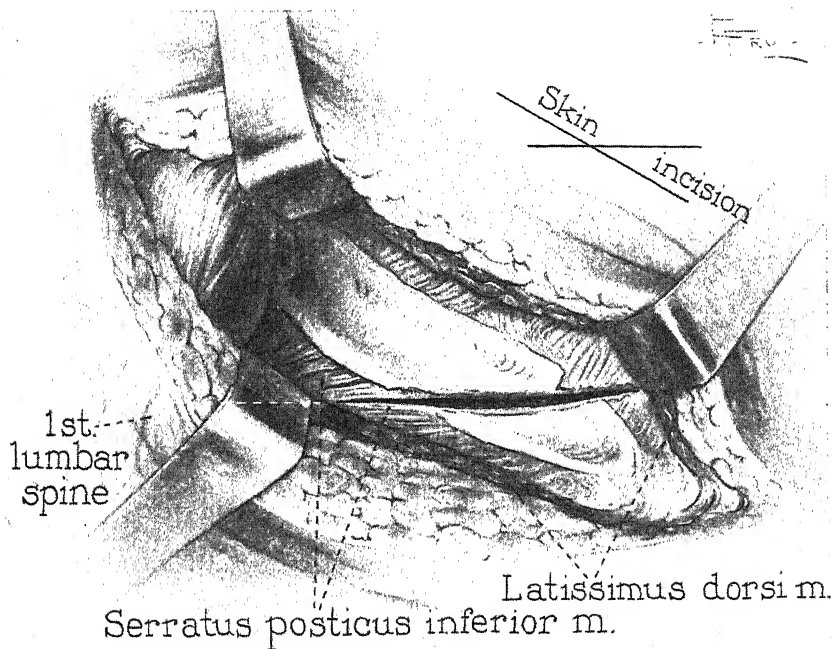
Historical.—The religion of the early Greeks was opposed to suicide. By Athenian law the body of a suicide could not be burnt on a pyre; it could not be buried until after sunset, and then only when the right hand had been cut off and burned apart. This abhorrence of suicide lasted until the rise of the Philosophic Schools, when it was swept away in the new era of reason which inculcated the popular doctrine of freedom to do as one likes with one's own body. In Rome the doctrine grew fashionable. It was when dissipation was running riot in Rome that self-destruction was at its height. So widespread did it become that both Greek and Roman authorities, in the hope of putting some check upon its prevalence, set up tribunals for the hearing of the applications of those who wished to die. If the applicant showed good cause for ending his life, his prayer was granted and he destroyed himself with the sanction of the court. The coming of Christianity undoubtedly mitigated the evil. Suicide among the early Christians became rare as compared with their pagan contemporaries, but did not completely disappear, so that in A.D. 452 the Council of Arles found it necessary to condemn it in all circumstances; from this time onwards it became much less common.

The tenets of Brahmanism and Buddhism and their peculiar teachings cannot but favour the commission of suicide. The doctrine of transmigration, which holds that the soul must make repeated journeys to Brahma until by constant purging it becomes sufficiently pure, is in itself a strong incentive to self-destruction. By this act the faithful not only shortens the period of separation from his god, but in the next incarnation he enters on a purer life than the life he surrenders. To the Buddhists life is a penance, and they are ever ready to

PLATE XLVIII

SUBPHRENIC ABSCESS

(A. OCHSNER AND A. M. GRAVES)



Drawing illustrating the transverse incision made through the bed of the resected twelfth rib and the serratus posterior inferior muscle at the level of the spinous process of the first lumbar vertebra. It is important that this incision does not parallel the original skin incision.

By kind permission of 'Annals of Surgery'

take leave of it on the slightest pretext. With the spread of western civilization the rate of oriental suicide shows a steady decrease.

Legal Aspect.—

1. Suicide is a felony if the act be committed deliberately by one who has arrived at years of discretion and is in his right mind.

2. *Suicide Pact*.—If two persons agree to commit suicide together and attempt to do so, and only one dies, the survivor is guilty of murder and may be hanged.

3. *Attempted Suicide*.—This is not looked upon as an attempt to commit murder, but is a misdemeanour. It may be punished by a term of imprisonment up to two years, or alternatively the accused may be required to enter into a recognizance to be of good behaviour for a reasonable time, to be specified in the judgement.

Vital Statistics.—Investigations have shown that each country has a characteristic suicide rate of its own which, while it may show some annual variations, yet maintains practically the same relative ratio to the rates of other countries. By the aid of international returns now available it is possible to estimate the number of probable suicides in any country in a year, e.g. :—

Ireland	..	22	suicides	per	one	million	inhabitants
England	..	90	"	"	"	"	"
France	..	120	"	"	"	"	"
Germany	..	150	"	"	"	"	"

These figures are pre-War and probably require revision. The proportion of male to female suicide is $3\frac{1}{2}$ to 1.

Age.—Suicide under 5 years is unknown, and is extremely rare under 10 years. After 10 years, the figures show an increase with each decade, the maximum being reached between 45 and 65 years, but many cases are reported at 70, 80, and even 100 years. At the other end of the scale a young girl of 14 years hanged herself in Paris because her parents had forbidden her to eat sweets; and a short time ago, in the United States, a boy of 12 drowned himself because his parents had refused him money to go to the cinema. On the Continent love affairs and failure at school examinations are stated to be common causes among juvenile offenders. The onset of puberty may be a factor here.

Season.—It is established that there is a seasonal influence. The greater number of suicides in all countries occur in spring and early summer, which is contrary to what might be expected, considering the hardships and privations commonly experienced during winter. It is suggested that the reasons for this are: (1) The exposure of the organism to a higher temperature; (2) The increased length of the working day and the desire to engage in bodily labour for a greater number of hours. The explanation is not a satisfactory one. MacErlean believes that owing to the greater strain which the organism endures during the winter season, its vital processes become diminished in efficiency, the general metabolic rate falls, the body's defensive mechanism (blood, antibodies, and its iodine content) are reduced quantitatively and qualitatively; hence, resistance to disease is reduced to so low a level that the body becomes an easy prey to infection and functional disturbances, and physiological balance is not properly regained until mid-May or June. Unlike the soil, what we sow in winter we reap in spring.

Unemployment.—The rate is nearly twice as high among unemployed as amongst employed males. This is an instance of the "weaker going to the wall." The man with a strong, healthy inheritance is more likely to be a fighter and to obtain employment; but the reason why his suicidal rate is lower is not because he is employed, but because his physiological system is the sounder of the two, which enables him to retain his employment longer.

Trades.—It is stated that the rate is higher in certain trades and professions than in others, that it is highest among soldiers, publicans, doctors, and chemists, and lowest among clergymen, engineers, and sailors, but the data offered in support of this contention are too indefinite and require further verification.

Modes.—The methods most commonly adopted in order of frequency are : (1) Hanging ; (2) Cut-throat ; (3) Drowning ; (4) Poisons ; (5) Firearms. It is of interest to note that there is a very definite choice of method exercised by the male and female respectively. Hanging comes first with males, then firearms, cut-throat, jumping off a height or throwing oneself beneath a train, whereas the females (and this may arise from their natural repugnance to physical disfigurement) select drowning first, then poison, hanging, and gas-oven suffocation. Females very rarely employ firearms for the purpose.

Time.—Most suicides occur in the forenoon or early afternoon. Night suicides are extremely rare. This the writer attributes to the dramatic instinct, which is highly developed in suicides. They seek spectacular notoriety, not only in the manner of their death, but also in their preliminary preparations for it. This is frequently shown by their flamboyant farewell letters, elaborate funeral directions, and other theatrical attempts to create an atmosphere of dispassionate reality. It is a histrionic exteriorization of the hysterical trait which is believed to lie concealed beneath the surface. Their life is a mask, and their death a pose.

Imitation.—Imitation of method is common. If an individual jumps from a high building in a city, several others will probably do the same. The author had to investigate recently two cases in which the victims had thrown themselves under moving trains, a mode of suicide rare in Ireland : a few months earlier he held inquiries into three cases of poisoning by a popular household disinfectant, all of which occurred in the same locality within the space of a few weeks. Press publicity may be an important factor in some instances by drawing the attention of the potential suicide to a particular mode.

Following a lengthy discussion of the neurological and psychological mechanisms associated with suicide, the writer summarizes his conclusions as follows :—

1. That, excluding the insane, all suicides are psychasthenics and introverts, and in many of them there is a marked element of hysteria interwoven in their natures.

2. That the predominant underlying factors are a narrowing of the field of consciousness and a fixed idea.

3. That when they commit the act they are probably suffering from a functional insanity, very often of physiological origin, and therefore difficult to detect, which explains the instances of so-called sane suicides.

Finally, is suicide ever justifiable? May not the desire to escape from physical suffering or social or financial ruin be urged as a legitimate motive for suicide? To the orthodox thinker such an admission would strike at the very foundations of the moral law, which he believes depends not upon the judgements of creatures, but upon the order intended by the Creator. Neither can the unorthodox justify it upon scientific or natural grounds; self-destruction is not of evolutionary origin. It is not found in the lower animals, who live, procreate their species, and die according to the fundamental instinct of their nature. Suicide therefore must be regarded as an acquired characteristic of mankind, and, appraised in terms of behaviour, it does not favour either the preservation or propagation of the species. It must consequently be looked upon as an anti-social act—one inimical to the well-being of the human family.

G. M. Davidson² has also written a lengthy paper on the problem of suicide. The following is a summary of his main conclusions :—

The Age Factor.—The author's patients were from 19 to 65 years old. The maximum rate of suicide in men occurs between 35 and 45, against 25 to 34 in women. Then there is an increase of the rate in ages 75 to 84 and 45 and 54, respectively, in men and women. He believes that the ages 45 to 54 in women and 75 to 84 in men correspond to involution changes, that the frequency of suicide in men at this advanced age, with few comparable suicides in women, is due to the fact that the woman's vitality is better preserved, as her ageing is slower than in men, because she undergoes involution earlier in life when re-adjustment of functions is easier. The ages of 35 to 44 and 25 to 34, in men and women respectively, would have the significance of their psychobiological difference. The fact that men attempt suicide more frequently than women would probably be because men are stronger in their impulse life, the women's affectivity being more passive in character. The woman is biologically better equipped to endure pain, while the social responsibility is greater in men than women. In reference to youth and adolescence, education is important, such individuals being inclined to develop either high idealism or cynicism.

Marriage.—The effect of marriage would seem to be of significance. Two-thirds of the writer's patients were single and one-third married. It is perhaps possible that the fact of marriage may stimulate a social and family instinct and provide the individual with confidence and a goal, except, of course, those marriages which are in opposition to the psychobiological equipment of the individual.

Occupation.—This would not seem to be of any significance except for the readiness of means of suicide which may arise from occupation.

Location.—The importance of location appears to lie entirely in the domain of suggestion.

Season.—Spring and fall would seem to be the chosen seasons for suicide. This is probably due to the strength of the individual cyclic instinctive manifestations.

Means.—The means of suicide apparently depends upon the acuteness of the condition, and is influenced by suggestion, masculine and feminine traits of the personality having some bearing upon it.

Heredity.—In reference to heredity the writer's material did not show anything of significance, and he cannot but agree with Jennings, who says, "In reference to inheritance of mental traits that heritage might lie fallow for want of such stimulus as environment for its quickening."

Race.—Concerning race he believes that we should not draw hasty conclusions from statistics. It is believed that the German race has the highest rate. Statistics show that the American mixed race has the same quota. Before we evaluate statistics we must consider scientific data concerning the question. Prominent investigators in this field and anthropological studies show that there is no racial personality in the true sense of the word (Garth), that there is only one racial human mind (Woodworth), that racial types are only an artificial concept (Haddon), that there are no inferior races, and that there is only a difference of culture (von Luschan). In fact, we see that the lowest rate of suicide is found where cultural standards are lower, such as in Mexico.

It would seem that in reference to the question of race, religion might be a contributory factor. The observation upon Hebrews may throw some light upon it. Morselli brings out that in the ancient history of Palestine not more than ten suicides are known; the greatest number belong to the period of Babylonian activity. In recent years the Jewish rate has greatly increased, and since

observation upon Jews shows that where they freely mix with the native population they are apt to absorb their traits, we cannot but conclude that environment, reformatory movements, education, and social conflict play a greater rôle than the question of race, and that perhaps religion plays a more important rôle than is believed. If we compare the statistics of Ireland, we see that in Northern Ireland, where the population is more Protestant, the suicidal rate is higher than in Catholic locations.

Motive.—We often observe that the given motive or cause for the suicidal act is rather trivial and naturally cannot be considered adequate. In order to understand its apparent justification, attention is called to the following observation of Ukhtomsky. He observes that various centres of the nervous system may not act in the usual manner. He shows that in the presence of an excitation that he calls 'dominant' some mechanism may be shut off. For instance, by stimulation of a certain region of the cerebral cortex of an animal, a perfectly defined local reaction may be produced—twitching of the leg muscles, for example. However, if the animal is about to perform the act of defecation, the same stimulus of the cerebral cortex at the same points no longer will produce twitching of the leg muscles. It appears that the pathway is blocked owing to the fact that at a given moment the cerebrospinal centres are aroused which are dominating at the given time, but at the moment the defecation takes place the blocking is relieved. This phenomenon may be observed under various conditions. Any impulse may become 'dominant'. In animals (cats) which are isolated from males during rut, the sex impulse becomes dominant. Other stimuli do not produce the usual effect, but generally accentuate the heat symptoms. Even in bromide stupor they will still produce the same symptoms as before. It is possible that in the suicidal cases the immediate situation is acting as a 'dominant', promoting an extreme contraction of the field of consciousness, a situation when unconscious elements have a better chance to manifest themselves. Undoubtedly, interceptive stimuli which may arise from physical disease may facilitate the creation of the dominant.

The above would seem to show the relative significance of each point in particular, and it would seem fruitless to look for a unitary cause whether physical or mental. The multiplicity of causes is evident, and only the study of the life record of the individual and his reactions to various attitudes in conjunction with his potentialities may throw some light in each particular case.

Mechanism.—The mechanism of suicide can perhaps be outlined as follows: At the time of suicide the individual has reached the limit of his resources. He lost his goal, which represented all conscious and unconscious cravings; he reached a state of extreme insecurity projected in fear of the unknown. The conscious motive, no matter how inadequate it may appear, mirrors the entire effective constellation of the individual. The motive perhaps playing the rôle of the 'dominant' produces an extreme contraction of the field of consciousness, a state of inattention to life. On the other hand, we may say that this is a state of splitting of the unity of functions, a state of psychosomatic imbalance with the result of general organic depression and consequent inability of the higher centres to comply with and control the incoming impulses and choose the action. He will cease to will, giving away to imagination, with the result that normal automatic rejection of what is unhealthy will cease.

Psycho-analytical Aspects of Suicide.—K. A. Menninger³ states that the conception of self-destruction as a flight from reality, from ill health, disgrace, poverty, and the like lends itself to the drawing of parallels between suicide and other regressions, and is seductive because of its simplicity. Its essential fallacy is one of incompleteness; it lies in the applied assumption that the forces impelling the regression come wholly from without. From the

standpoint of analytical psychology the ego is driven by more powerful forces than reality. It is maintained that suicide is a gratification of self-destructive tendencies, which on analysis appear to be composed at least of two elements: an aggressive element—the wish to kill—and a submissive element—the wish to be killed. In addition, it is postulated that a wish to die may be present to a variable degree, for which, however, no definite psychological evidence can be offered. The three components are derived respectively from the ego, the super-ego, and the id. From the clinical material studied it is shown that the proportional strength of these components varies considerably in various instances.

REFERENCES.—¹*Irish Jour. Med. Sci.* 1934, cii, 241; ²*Med. Record*, 1934, cxxxix, Jan. 3, 24; ³*Internat. Jour. of Psycho-anal.* 1933, xix, 376.

SUN-BATHING. (See ULTRA-VIOLET RADIATION.)

SUNSTROKE. (See HEATSTROKE.)

SUPRARENAL GLANDS. (See ADRENAL GLANDS.)

SURGICAL TECHNIQUE.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Catgut and Silk Sutures.—In recent years the use of unabsorbable sutures, such as silk and cotton thread, has to some extent been revived. Kocher up to 1917, at the time of his death, used fine silk almost indiscriminately. His aseptic technique was admirable. Furthermore, the sterilization of catgut at that time was uncertain.

E. L. Howes¹ discusses the strength of wounds sutured with catgut and silk, and he quotes Halsted as saying there is not only greater local reaction in cases sewed with catgut, but in them the wounds will occasionally open and discharge a few drops of clear or cloudy fluid. Howes does not think there is much difference in the inflammatory reactions along the suture tracks when silk or catgut is employed under the serosa of the stomach. He concludes, however, by saying that in the case of silk, wounds accumulate strength more rapidly than those sutured with catgut. He also states that experiments showed that there was no advantage in using sutures of large dimensions. The larger sizes of silk or catgut give no additional strength to the wounds, either immediately after suturing or during healing. The experiments were conducted on the stomachs of rats.

A. O. Whipple² gives a good account of the use of silk in the repair of clean wounds. He very properly draws attention to the fact that primary wound healing does not depend alone upon the effort to exclude pyogenic organisms. For example, dead or compromised tissue, which has been devascularized by crushing clamps, tight ligatures, sutures, etc., acts as a foreign body. Under such circumstances there may be suppuration in a wound closed with aseptic technique.

Silk must not be used unless the surgeon is willing to carry out certain rigid rules in technique. Errors to be avoided are: (1) Tight sutures; (2) Mass ligatures; (3) Blunt scissors dissection; (4) Careless hæmostasis; (5) The use of any but the finest grades of silk. Silks that will not break should not be used. Howes states that after careful training of each individual surgeon in the use of silk his cases have nearly approached 100 per cent clean-wound healing. He is convinced that the wounds are strong and freer from later hernia than at any time when he was using catgut. [It appears to the reviewer that the essence of the discussion hangs around the question of whether the surgeon and the assistants and nurses have a thorough practical training in

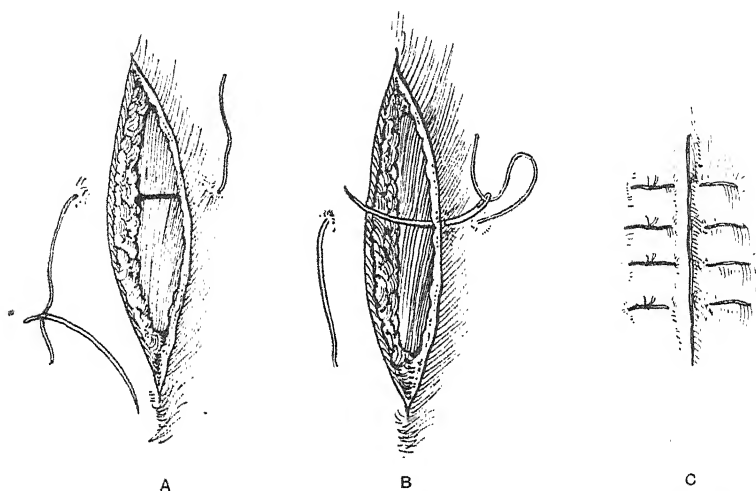


Fig. 47.—Interrupted on-end or vertical mattress suture. Redrawn from McMillen, 1909. **A**, The first or deep part of the stitch is introduced in the same manner as any interrupted suture. **B**, The reverse end of the suture is threaded on the needle, or the needle is reversed, and passed through the skin very close to the margin. **C**, The sutures are drawn tight enough to bring the deeper portions of the wound together and are tied. The cut surfaces will be in exact apposition and the wound edges slightly everted.

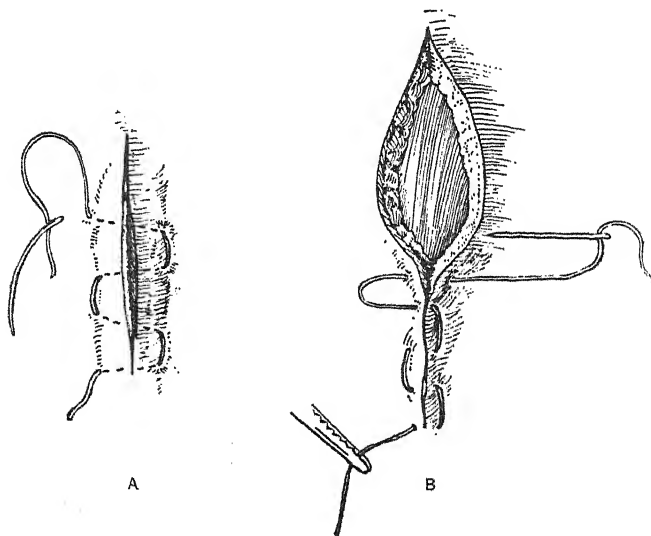


Fig. 48.—Continuous mattress skin suture. **A**, Redrawn from Wyeth, 1887. **B**, Redrawn from Willard Bartlett, 1912. The needle is introduced a little to one side at the very end of the wound and passing under the skin is brought out at a point directly opposite. It is then reversed and passed back through both lips, being inserted a little higher along the wound. Sufficient tension is exerted to permit an easy falling together of the wound edges. This procedure is repeated until the wound is closed. It will be noted that the purpose of this suture is to keep the skin edges from turning in and that it is inserted in exactly the reverse way from the continuous mattress intestinal suture of Cushing which is designed to turn in the margins.

(Figs. 47, 48 re-drawn from the 'Annals of Surgery'.)

aseptic technique. Silk is ideal if every member of the team can be depended upon, but it is better to use catgut if any uncertainty exists. It is disappointing to find that outside the smaller university towns where a critical eye is kept on the results of operation on individual cases aseptic surgery in its strictest sense is little practised. Exceptions are to be found in special clinics, and often amongst surgeons dealing only with the brain, or bones and joints. The rule might well be laid down that where team work is made an essential in an institution silk may be used. Under more antiquated circumstances where team work is not practised, better results will be obtained by the use of catgut.—W. I. de C. W.]

The Vertical Mattress Suture.—Staige Davis² refers to the on-end or vertical mattress suture. The *interrupted* form of this suture is shown in Fig. 47 and is now used extensively by most surgeons. The author never uses catgut for suturing the skin. A much less conspicuous scar can be obtained by closure with horse-hair, fine wax silk, or some other fine unabsorbable suture material. The *continuous* mattress skin suture shown in Fig. 48 is a method of closure which should be more frequently employed. The suture is simple and speedy of execution, it is fool-proof, and the edges cannot invert or evert.

A twin needle used by the reviewer (Fig. 49) introduces Halstead interrupted sutures very rapidly in difficult cases. The catgut between the needle points after threading must be well pulled out into a loop before the needle is withdrawn.

Skin-grafting.—The appliances and methods for transplantation of the skin described by Kirschner¹ are very similar in design and principle to those described by the late Mr. Lane Joynt, Meath Hospital, Dublin, published in the MEDICAL

ANNUAL of 1930, p. 465, and illustrated in *Plates XXXVIII, XXXIX* in that volume. The following is a summary² of Kirschner's article:—

In the transplantation of epidermis it is better, for cosmetic reasons; to use one large flap than several smaller pieces. In the use of Thiersch grafts there is a constantly increasing demand for greater thickness, length, and width of the grafts.

The author's epidermis elevator is a modification of the Schepelmann scalpel. The modification consisted in diminishing the angle of the scalpel to the skin surface. To stretch the skin of the thigh in a transverse direction successfully, Kirschner has devised an apparatus with which the stretched skin forms a wide

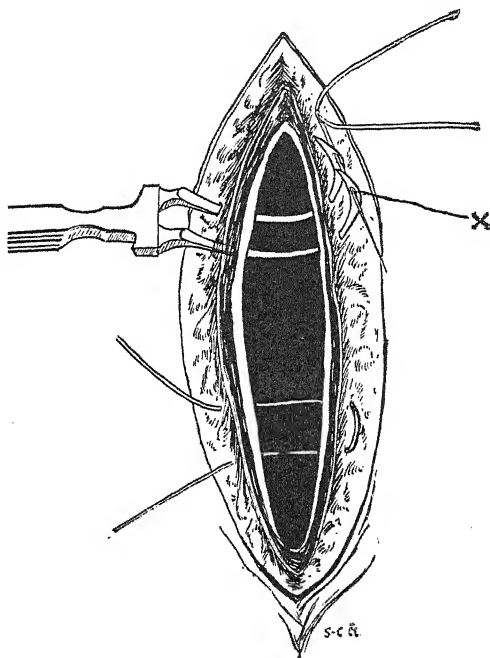


Fig. 49.—Wheeler's twin needle. Note method of threading with straight sewing needle. (By kind permission of the 'British Medical Journal'.)

plane and the point of attack on the skin lies below rather than above its normal level so that the cutting process is not hindered.

At a distance of from 10 to 15 cm. apart, which is somewhat wider than the proposed skin flap, two steel rods with sharp points and removable handles are bored under the skin of the thigh in a distal-to-proximal direction so that the ends protrude from the skin (*Plate XLIX, A*). The knee is flexed and hangs over the edge of the table. On their sides the rods have slits into which fit the ends of four curved steel bridles about 10 cm. long. Two of these bridles with chains attached are fitted to the rods as shown in *Plate XLIX, B*, and the skin between the rods is markedly stretched by pulling on the chains. Thiersch grafts of any length, width, and thickness may then be cut. For the taking of homoplastic grafts from recently amputated extremities the author has devised a board (*Plate L, A*) which is based on the same principle of skin tension and fixation.

The skin should be rubbed with physiological salt solution, but as the danger of infection is not great no disinfectant should be applied to it.

The less the friction with which the scalpel glides over the skin, the easier the flaps are cut. For moistening, olive oil is preferable to physiological salt solution as it prevents drying of the transplant.

The cutting of the epidermal flaps should be the last act of the operation. The area to be grafted should be prepared first and the epidermal flaps then applied immediately. There should be absolute hæmostasis of the part treated. An excellent procedure for this purpose is electrocoagulation with a diathermy knife or needle. If this fails, the Thiersch flaps should be perforated.

An excellent dressing for the wound is Sirius gauze fastened in place at the edges of the transplanted surface with mastisol and sutured to the skin edges by a few stitches. This prevents displacement of the transplant. The gauze should be removed after from eight to ten days. Later, the Thiersch graft may be painted with zinc oil.

To prevent the accumulation of blood and tissue juices under the graft, elastic pressure should be maintained by means of a rubber sponge that has been boiled in physiological saline solution and squeezed into dry towels. This should be applied to the gauze-covered transplant with elastoplast under slight tension (*Plate L, B*).

In discussing skin-grafts F. Beekman and R. J. O'Connell⁶ state that the type of graft to be used is purely one of personal choice. Some type of free graft is preferable, as the pedicle flaps are unsatisfactory when employed upon a granulating surface owing to the danger of infection. The same objection applies to full-thickness grafts (Wolff). These writers prefer full-thickness 'pinch grafts', also referred to as 'small deep grafts'. These are preferable to all others, but they give a poor cosmetic result as the spotty-like character of the scar is not attractive.

[The reviewer has employed these grafts on many occasions and the technique is simple: $\frac{1}{2}$ per cent solution of novocain is injected closely under the skin from which the grafts are to be taken. A cone-like projection of skin is raised up on the point of a straight needle. This is cut off with a razor blade or sharp knife, the flat surface of the blade being held in the same plane as that of the skin. The more the needle is lifted up, the greater the size and depth of the graft; the average size of a pinch graft is less than half an inch in diameter, and after removal it diminishes by shrinking. There should be no fat on the deep surface. The grafts are carried on the point of a needle to the raw granulated surfaces. About four grafts are placed to the square inch. In some situations it is convenient to implant the pinch grafts into the depths of the granulations.—W. I. de C. W.]

PLATE XLIX

SKIN-GRAFTING

(KIRSCHNER)

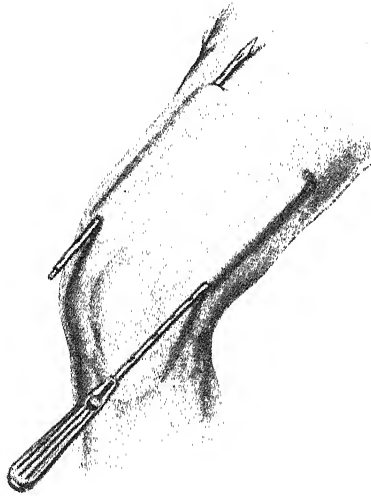


Fig. A.—Introduction of steel rods to stretch the skin for the removal of Thiersch flaps.

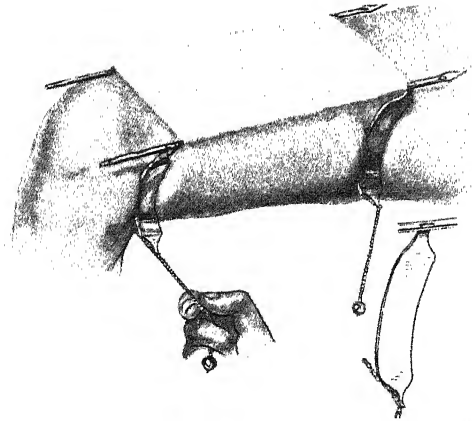


Fig. B.—Application of steel bristles and chains to stretch the skin for the removal of Thiersch flaps.

*By kind permission of
Surgery, Gynecology and Obstetrics'*

PLATE L

SKIN-GRAFTING—*continued*

(KIRSCHNER)

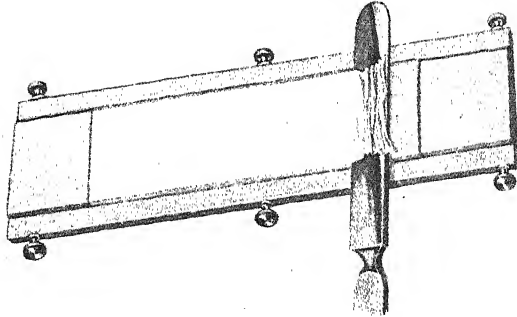


Fig. A.—Board to stretch the skin for the removal of Thiersch flaps.

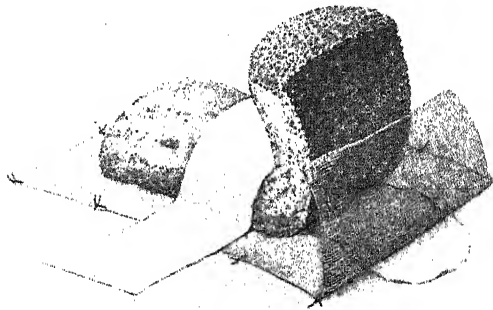


Fig. B.—Rubber-sponge pressure dressing for Thiersch transplants.

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'Surgery, Gynecology and Obstetrics'*

PLATE LI

SKIN-GRAFTING—*continued*

(F. BEEKMAN AND R. J. O'CONNELL)



Character of new skin following 'pinch-grafting'; seven years after accident.

By kind permission of 'Annals of Surgery

Beckman and O'Connell cover the grafted surfaces with strips of paraffin gauze. This is cut into strips $1\frac{1}{2}$ in. wide and sufficiently long to extend for a few inches beyond the edge of the wound. The strips are placed so that the edge of one overlaps the other. These are covered with four or five thicknesses of gauze, which is bandaged in place with a gauze roll. Several layers of wool (non-absorbent cotton is more elastic) are firmly bandaged and held in place by strips of adhesive plaster. The object is to obtain firm pressure. The part is then encased in light plaster so as to immobilize the proximal and distal joints. [The reviewer uses elastoplast over the gauze and wool, and omits the plaster.—W. I. de C. W.] The dressing is not disturbed for eight days, and is then dressed with vaseline gauze strips. The effective nature of a skin-graft but the poor cosmetic result is shown in *Plate LI*.

Treatment of Cutaneous Ulcers.—L. A. Brunsting and Daisy G. Simonsen⁷ recommend the use of the amino-acid *cysteine*. It is prepared from the hair of men. Such keratin-containing structures as hair, nails, hoofs, horns, and sheep-wool are particularly rich in sulphur. Most of it is present in the form of disulphate cystine. Cysteine is readily oxidized to cystine. Two decided changes were brought about in ulcers following the use of cysteine: (1) Stimulation of granulation tissue and epithelial proliferation; and (2) Diminution of drainage with clearing of secondary infection. Cysteine was employed in a concentration of 1.5 per cent solution. The solution contains equal parts of normal saline solution and distilled water; for each gramme of cysteine 6.35 c.c. of normal sodium hydroxide is added. This gives a neutral solution. It is used when fresh. Dressings are changed twice daily or more often if required.

Continuous Intravenous Saline Solution.—The value of continuous intravenous saline was pointed out last year (p. 417). The reviewer has for many years employed this method and drew attention to its advantages as described by Hendon in the *MEDICAL ANNUAL* for 1931 (p. 377). The solution usually employed was a 5 per cent dextrose solution in normal saline. It was found to be a more effective method than the introduction of fluids into the rectum by the Murphy drip. Furthermore, its application was simple and in many cases the nursing of the patient was less arduous than when the fluid was administered per rectum. Dextrose solutions given continuously into the veins were found particularly useful in cases of potential or actual uræmia, before and after operations on the urinary tract. So far as nutrition is concerned, the introduction of fluids continuously by the veins supplies nourishment independently of the gastro-intestinal system.

Hendon suggests that the fluid should be delivered from a thermos flask. There is, however, a disadvantage, inasmuch as a thermos flask cannot be boiled. The temperature of fluid introduced drip by drip need not be so carefully controlled as in the case of larger amounts given at intervals. The simplest plan is to place the fluid in a boiled glass flask with a rubber cork perforated for the reception of two glass tubes. One glass tube is long and reaches to the bottom of the flask; to this the rubber tubing and cannula for introduction into the vein is attached. A rubber bulb is attached to a short glass tube and by compression of this the flow of fluid can be started. The flask stands above the bed in a bowl of hot water on a douche stand. A Higginson's syringe may be used for emptying the bowl when it requires replenishment with hot water. The fluid is allowed to trickle in through a visible dripper. Hendon recommended that an adult patient should not receive less than 4000 c.c. of 10 per cent dextrose solution in the twenty-four hours. The urine output in most cases is approximately half the amount of the fluid administered. The reviewer found that in some instances a 10 per cent solution was too concentrated and caused thrombosis of the veins with cessation of the flow.

The urine should be examined daily. So long as only a trace of sugar appears the administration should be continued. As a post-operative treatment in cases of severe shock venoclysis has few equals. Hendon stated that the method had been most successful in cases of emesis gravidarum.

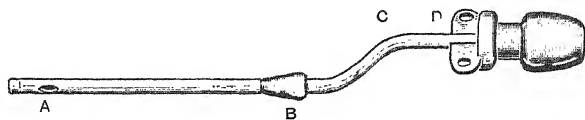


Fig. 50.—A cannula for venoclysis. It is gold-plated to prevent corrosion. There are two lateral holes (A) in addition to the terminal opening. The collar (B) allows the straight portion of the cannula to be tied into the vein snugly. The sloping neck (C) can be bent to any angle suitable for varying depths of subcutaneous fat in individual cases. The perforations in the wings (D) permit anchoring the apparatus to the skin by means of sutures.

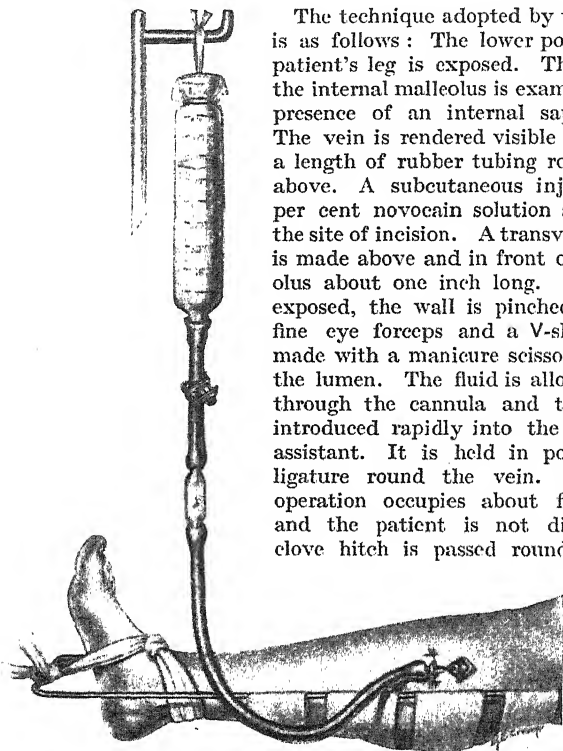


Fig. 51.—The apparatus in use. In very ill patients who are restless, or may become so, this method of fixing the limb minimizes displacement of the cannula. (Figs. 50, 51 by kind permission of the 'British Medical Journal'.)

and the foot is anchored loosely to the end of the bed. The rate of flow is arranged at about one drop per second.

Hamilton Bailey and J. M. Carnow⁸ discuss the subject. They state that the veins about the elbow are too large, and refer to the impracticability of keeping the elbow extended and at rest for some days. They prefer to tie the cannula

into the saphena or one of its branches a hand's breadth below the knee or just in front of the internal malleolus. The cannula and the wound should be moist with citrate solution at the time of the introduction. To keep the limb at rest when the lower extremity is selected a back splint with a foot-piece may be used in a restless patient. A Thomas knee splint ensures that the cannula does not become displaced. Bandages around the limb must be avoided. (*Figs. 50, 51.*)

These writers enumerate the precautions for preventing reactions. [The reviewer, however, has found that reactions do not occur when the drip method of intravenous medication is employed.] They mention that matched citrated blood can be added to the intravenous fluid, and thus the patient receives a transfusion with no more fuss and disturbance than is involved when giving him a drink.

It was pointed out in the MEDICAL ANNUAL for 1934 (p. 371) that Merck's dextrose is chemically pure. A solution of this and sodium chloride is made from freshly distilled water, filtered twice, and the flask is put in the autoclave for fifteen minutes under 15 lb. pressure. Glucose in sealed glass tubes is not always chemically pure. Too short or too long a period in the autoclave may produce changes in the solution which for some unaccountable reason are responsible for reactions.

S. A. Thompson⁹ adds to our knowledge about the preparation of distilled water for saline solution for intravenous and subcutaneous use. He points out that several years ago it was demonstrated that 50 per cent of all ordinary distilled water contained a fever-producing substance which was called *pyrogen*. Pyrogen is a product of bacterial origin; it is soluble, filterable, and resistant to heat. Apparently the use of a water spray trap in the still is the only effectual method of eliminating pyrogen. Repeated distillation and sterilization will not suffice. The author emphasizes the fact that a single proper distillation will be non-pyrogenic, while repeated ordinary distillations may be pyrogenic. The paper deals also with the question of impure drugs, impurities from glass-ware and metals, and the effects produced by the variable temperatures of the solution and improper sterilization. It is mentioned that repeated sterilization of glucose solution under high pressure will cause a caramelization which sometimes results in severe reactions. These solutions have a pale yellow to golden-brown colour and should be discarded.

Blood Transfusion.—For general use probably the citrated method remains the simplest. The disadvantages are more theoretical than real, and in any event whole blood transfusions are never applicable unless in very skilled hands and are not suitable for emergency requirements. It has never been definitely proved that reactions are due to the addition of sodium citrate. Reactions are minimized if the temperature of the blood is kept nearly at body temperature and if the transfusions are given slowly; twenty minutes to half an hour should be the least time for a blood transfusion of 500 to 600 c.c. If a patient is likely to require several transfusions it is an advantage to give only 200 c.c. on the first occasion. If there is a sharp reaction after careful typing of the bloods, the reviewer has found it an advantage to employ another donor. If a patient is Type II and a donor is obtained, also Type II, and the blood by every test appears compatible with the blood of the recipient, yet a severe reaction may occur. In such a case it is wise to get a universal donor for the second transfusion. In every case the direct test between the donor's blood and the patient's serum should be employed.

G. Keynes¹⁰ writes an interesting article on this subject. He states that the donors should be tested by the Wassermann reaction and that they should maintain a proper standard of good health. He rightly points out that the

term 'universal donor' must not be translated too literally. In a discussion which followed Keynes's paper, H. F. Brewer stated that a donor subject to a protein-sensitive condition such as asthma, urticaria, hay-fever, etc., may transmit this sensitivity. He thinks that Group IV donors should be reserved, except in cases of emergency, for Group IV patients, and he also emphasizes the necessity for the direct test. It is essential, he says, to keep the temperature of the transfused blood at body heat throughout the procedure. If severe reaction occurs, it is best controlled by morphia and adrenalin hypodermically.

Incompatibility does occur rarely between bloods which according to the general grouping should be acceptable. Group II individuals are most prone to exhibit this abnormality. In these cases it may be necessary to test the blood of a series of what should be compatible donors against the recipient's serum before an acceptable one is found. Brewer's observations as to the result of repeated blood transfusions on donors bears out the work of the Mayo Clinic that no harmful result accrues, but the intervals between donations should be three months for men and four months for women.

P. L. Oliver¹¹ gives a learned review of the subject of blood transfusions more especially from the donor's point of view. He insists that the needle points should be constantly sharpened. [The reviewer believes this to be a small but most important part of the technique. A new needle or newly-sharpened needle should be used on every occasion. Difficulty in introducing needles, not only into the veins, but into the spinal canal, the chest, or elsewhere, is due more to bluntness than to any other factor.—W. I. de C. W.]

Pressure Sores.—E. O. Latimer¹² describes the treatment of pressure sores with *tannic acid*. Pressure tends to produce a local ischæmia with subsequent thrombosis, death of tissue, and ulcer formation. Once the lesion has developed, various remedies are employed—zinc oxide, scarlet red ointment, silver nitrate solution, ultra-violet rays, etc. A fresh 5 per cent aqueous solution of tannic acid is recommended. Treatment is commenced at the first sign of tissue disturbance, preferably before the skin is broken. It is carried out in exactly the same manner as the treatment of burns.

The presence of an infection is not necessarily a contra-indication to this method of treatment. The infection is controlled by antiseptic solutions in the first instance. Occasionally it is necessary to remove the coagulum several times because of infection. Each time the crust is removed the wound will be found to have decreased in size. The results have been gratifying in lesions following cord injuries, bedridden diabetic patients, and pressure sores from plaster-of-Paris and splints.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1933, Sept., 309; ²*Ann. of Surg.* 1933, Oct., 662; ³*Ibid.* Nov., 941; ⁴*Acta chir. Scand.* 1932, lxxii, 21; ⁵*Surg. Gynecol. and Obst.* 1933, Sept., 259; ⁶*Ann. of Surg.* 1933, Sept., 394; ⁷*Jour. Amer. Med. Assoc.* 1933, ci, Dec. 16, 1937; ⁸*Brit. Med. Jour.* 1934, i, Jan. 6, 11; ⁹*Amer. Jour. Surg.* 1933, Oct., 127; ¹⁰*Jour. of State Med.* 1933, Dec., 12; ¹¹*Ibid.* 698; ¹²*Jour. Amer. Med. Assoc.* 1934, March 10, 951.

SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.

Geoffrey Jefferson, M.S., F.R.C.S.

A comprehensive paper on the anatomy of the peripheral sympathetic nervous system by H. H. Woollard and R. E. Norrish,¹ and another of a very independent nature by H. Trumble,² well repay study. The first paper follows the classical lines. Trumble's work goes farther, as it is based essentially on a biological approach, and this worker adduces reasons for criticizing the nomenclature of certain sympathetic nerves. Papers by G. E. Gask³ and Paterson Ross⁴ forecast the views expressed in their recent most valuable book. René Leriche and R. Fontaine,⁵ in a very well illustrated article, describe the

various approaches to the lumbar ganglia. They have had 4 deaths in 76 operations, usually from embolism.

P. G. Flothow and G. W. Swift⁶ give the results of sympathetic ganglionectomy in various conditions. They classify Raynaud's disease and scleroderma together on the ground that the two so commonly overlap. They have done 23 operations on 10 patients, 11 for the lower extremity and 12 for the upper. The scleroderma cases have not done notably well, and they feel that the ultimate prognosis is bad. They note, what most other surgeons have noted, that in Raynaud's disease the upper limbs are not so much relieved as the lower, but they make no contribution on the point. Indeed, their comments have an old-fashioned ring, since they think it must be due to incomplete denervation. In thrombo-angiitis obliterans 9 of 11 cases gave excellent results. They are disappointed with the effects in arthritis, though they state that in 7 out of 10 the operation was worth while. They give no standards, however, by which one can truly tell how far this judgement is well founded. They have removed the left lumbar ganglionic chain three times for megacolon with good results. They emphasize the importance of removal of the first lumbar ganglion if success is to be attained. They claim equal success in 5 sufferers from chronic constipation, better results than most other surgeons have obtained. They now use the retroperitoneal approach of Royle, having had two deaths after the transperitoneal operation.

E. J. Donovan⁷ reports two cases of Hirschsprung's disease cured by excision of the presacral nerve and the inferior mesenteric. These cases are well described and the results were excellent. In the discussion following the report of these cases E. W. Peterson⁸ spoke of three personal successes, and F. A. Bothe⁹ of another. The last is an important one as the patient is one of the youngest on record—2 years old at the time of operation.

For dysmenorrhœa A. A. Davis,¹⁰ whose work on the presacral nerve is, with that of Learmonth, of classical importance, discussed the various operations that have been carried out. M. Donaldson¹¹ and S. Fosdike¹² reported the results in respectively 16 and 8 cases. Each had one complete failure, each 2 complete successes. The great majority of the remainder were sufficiently improved to make them feel that the operation was worth while.

(See also BLADDER, SURGERY OF—PRESACRAL NEURECTOMY.)

REFERENCES.—¹*Brit. Jour. Surg.* 1933, xxi, July, 83; ²*Ibid.* 1934, xxi, April, 664; ³*Ibid.* 1933, xxi, July, 113; ⁴*Ibid.* 5; ⁵*Presse méd.* 1933, Nov., 1819; ⁶*Amer. Jour. Surg.* 1933, Sept., 345; ⁷*Ann. of Surg.* 1933, Aug., 303; ⁸*Ibid.*, 305; ⁹*Ibid.*, 307; ¹⁰*Proc. Roy. Soc. Med.* 1934, Jan., 258; ¹¹*Ibid.*, 263; ¹²*Ibid.*, 267.

SYPHILIS.

Col. L. W. Harrison, D.S.O.

EXPERIMENTAL.

The Relationship of Yaws to Syphilis.—As is well known, many authorities are of opinion that yaws and syphilis are identical, while others maintain that they are different though *S. pallida* and *S. pertenue* are morphologically indistinguishable from one another. Arguments based on the differences in behaviour of 'yaws' and 'syphilis' respectively in human beings have led to no firm conclusion, but the experimental work of Thomas B. Turner and Alan M. Chesney¹ should go far towards settling the question. These workers inoculated rabbits from eight cases of yaws in widely separated districts of Haiti and at the same time a strain of *S. pallida* was isolated from a typical syphilitic chancre in a native of Haiti. The behaviour of the resulting lesions showed quite definite differences between those due to the yaws spirochaetes and those due to the syphilitic. In the yaws rabbits the average incubation was definitely longer and the primary testicular lesion was a granular orchitis

contrasting with the diffuse infiltration in the syphilitic. The metastatic involvement of the scrotum in yaws was much milder than in syphilis, and generalized lesions of the bone, skin, and eye, which are common features of rabbit syphilis, did not occur in any of the 135 rabbits ultimately infected with yaws. For this comparison there was available not only the six laboratory stock strains of *S. pallida* but also the strain isolated from the Haiti case of syphilis and passed through twenty generations in rabbits. The authors say, "When one considers that the two experimental infections were observed concurrently in series of rabbits kept in the same animal quarters and under the same general conditions as regards diet, caging and bedding, so that the only variables were the strains of treponemes themselves it is difficult to escape the conclusion that the differences observed in the two experimental infections were to be ascribed to inherent differences in the strains of spirochaetes themselves." (See also YAWS.)

Cultivability of *Spirochæta pallida*.—F. Jahnelt² has produced strong evidence that *S. pallida* has never been grown in an artificial medium. He has had no difficulty in growing the alleged *S. pallida* sent to him by various workers, but has never succeeded in isolating the organism from syphilitic material on any of the media stated to be suitable for its growth. Further, the cultural organisms differ morphologically from *S. pallida* in syphilitic lesions, they are completely non-pathogenic, and when injected into animals stimulate the formation of antisera which act only on cultural '*S. pallida*' not on *S. pallida* in the secretion from syphilitic lesions. He concludes that the cultural '*S. pallida*' are merely contaminating spirochaetes. In his scepticism respecting the cultivability of *S. pallida* he is in agreement with Kast and Kolmer, Gammel, Ecker, and others.

DIAGNOSIS.

Signs of Syphilis during the Primary Incubation Period.—G. Louste³ draws particular attention to a sign of syphilis occurring almost constantly in the primary incubation period—namely, a moderate enlargement of the spleen, which he has found in 95 out of 100 cases examined during the past eight years. The enlargement usually appears fifteen days before the chancre, and disappears quickly under treatment. It would be a useful sign in showing the advent of the syphilitic element in a case of mixed infection. Splenomegaly, like the fall in hæmoglobin which also occurs in the incubation period, shows how quickly *S. pallida* enters the blood and makes its influence felt. Other evidence of this invasion is provided by the cases in which transfusion has conveyed syphilis as long as ten days before the donor's primary sore has appeared.

Umbilical-cord-blood Wassermann Tests.—J. Roby and P. A. Lemboke⁴ provide further evidence that the cord-blood reaction is simply a reflex of the state of the mother's blood and is no guide to the state of the infant from the point of view of syphilitic infection. In 223 of 225 cases they found practical agreement between the reaction of the mother's and that of the cord-blood; in one of the two disagreements the mother's blood was not taken on the day of the labour. The authors show in a table details of 15 cases in which the mother's and the cord-blood were positive but the infant's blood subsequently became and remained negative without any treatment. In 9 other cases the cord-blood was not tested but the mother's blood was positive at the time of the labour. Shortly after birth the infant's blood showed some degree of positivity but subsequently became negative. It follows that, if treatment is instituted on the strength of the cord-blood being positive and the infant's blood is subsequently found to be negative, the credit is by no means

necessarily due to the treatment. The authors estimate that in most cases the substances responsible for a positive reaction of a healthy new-born infant's blood have passed out of its circulation by the end of two months; a decreasing strength of reaction in a recently born infant is an indication to withhold treatment.

Teeth in Congenital Syphilis.—E. Vais⁵ has discussed in detail the numerous dystrophies of teeth described by a large number of authors and attributed by them to congenital syphilis. He shows that, with the possible exception of Hutchinsonian teeth, none is pathognomonic. Others may occur frequently in congenital syphilis, but here syphilis only takes its place with a large number of other infantile diseases as a factor in the etiology. They may occur more frequently in congenital syphilis also because this predisposes to other infantile complaints. With regard to Hutchinsonian teeth, he appears inclined to accept these whole-heartedly only when accompanied by ocular and aural disabilities.

TREATMENT.

Prophylactic Treatment.—Prophylactic treatment of syphilis by arsenical remedies has been recommended by a number of workers who have reported successes. On the other hand, various authors have reported failures, and it is evident that syphilis is not prevented with certainty by the swallowing of a few tablets of such a remedy as stovarsol. G. I. Mestschersky and A. B. Selissky⁶ criticize the successes which have been claimed on the grounds that the cases were not observed sufficiently long afterwards. They report a failure with stovarsol. The patient, a physician who had previously had no sexual intercourse for a number of months, sought the advice of another practitioner two hours after a risk. Local prophylactic treatment was administered, and during the next four days he took 5 gm. stovarsol. A primary sore appeared forty-nine days after the risk. The authors remark that the preventive treatment had been carried out with the exactness of a laboratory experiment. They draw attention again to the risk of the treatment delaying the onset of symptoms or being followed by a symptomless infection. On similar lines they criticize preventive treatment by injections of arsenobenzene compounds. Conversely, they point out that contact with a person suffering from early syphilis is not necessarily followed by infection and report cases in illustration of the fact.

A Standard Treatment of Early Syphilis.—J. H. Stokes and colleagues,⁷ as a result of an analysis of the records of 3224 cases of syphilis treated in five U.S.A. clinics and followed up for six months or longer, suggest a standard form of treatment for average cases of early syphilis. They defend such standardization by saying that, although individualization of treatment is essential in late cases, it is not called for in the very great majority of early cases, who are usually young, healthy, and capable of tolerating a considerable amount of treatment. The authors claim that the 'continuous' form of treatment, using both arsphenamine preparations and heavy metal, preferably bismuth, produced the best results in their series, and they condemn the intermittent treatment (with rest intervals between courses), irregular treatment, the 'abortive cure', once very popular in Germany, and that form in which the physician treats only until the serum reactions become negative. With the best forms of continuous treatment commenced at the most favourable (sero-negative primary) stage the analytical study of the case records showed 83 to 86 per cent satisfactory results and an average of 71.4 per cent with all forms of continuous treatment. Continuous treatment commenced in the sero-positive primary stage afforded only 64 to 70 per cent satisfactory results

at best, and 53 per cent average. The treatment schedule suggested by the authors is as follows:—

TREATMENT SCHEDULE IN SYPHILIS.

DAY OR WEEK	ARSPHENAMINE	INTERIM TREATMENT	BLOOD WASSER- MANN REACTION	COMMENT
Day 1	Grm. 0.3-0.6	1	Arsphenamine dosage for first 3 injections at level of 0.1 gm. for each 25 lb. body weight; average subsequent dosage, 0.4 gm. men; 0.3 gm. women; in average patient all lesions heal rapidly and blood Wassermann reaction becomes negative during first course; if arsphenamine cannot be used, substitute 8 to 10 doses of 0.3 gm. silver arsphenamine, or 10 to 12 doses 0.6 gm. neo-arsphenamine; this applies also to subsequent courses
5	0.3-0.6			
10	0.3-0.6			
Week 3	0.4			
4	0.4			
5	0.4			
6	0.4			
7	0.4	1	If mercury is used note overlap of 1 week at end of first and start of second arsphenamine courses; at this point a few days without treatment may be dangerous; neuro-recurrence
8	..	Bismuth, 4 doses, 0.2 gm., and KI		
9		or Ung. Hg and		
10		KI		
11				
12	0.4	1	Arsphenamine starts, bismuth stops; watch for provocative Wassermann reaction after first dose of arsphenamine
13	0.4	.. ..	1
14	0.4	Try to prevent short lapses in treatment, especially at this early stage
15	0.4			
16	0.4			
17	0.4	.. ..	1
18-23	..	Bismuth, 6 doses, or Ung. Hg and KI	..	Bismuth is better than mercury; use it if possible, examine cerebrospinal fluid at about this time if patient's co-operation can be secured
24	0.4			
25	0.4			
26	0.4			
27	0.4			
28	0.4			
29	0.4			
30-37	..	Bismuth, 8 doses, or Hg and KI		
38	0.4	1	Patients with sero-negative primary syphilis may cease treatment here, if blood Wassermann reaction has always been negative
39	0.4			
40	0.4			
41	0.4			
42	0.4			
43	0.4	.. ..	1

TREATMENT SCHEDULE IN SYPHILIS—*continued.*

DAY OR WEEK	ARSPHENAMINE	INTERIM TREATMENT	BLOOD WASSERMAN REACTION	COMMENT
Week	Grm.			
44-53	..	Bismuth, 10 doses, or Ung. Hg and KI	..	Note that bismuth or mercury courses are gradually getting longer—4, 6, 8, and now 10 weeks
54	0.4	.. ..	1	The average sero-positive primary or early secondary patient should have at least 5 courses of arsphenamine
55	0.4	.. ..	..
56	0.4			
57	0.4			
58	0.4			
59	0.4	.. ..	1	
60-69	..	Bismuth, 10 doses, or Ung. Hg and KI	..	It is safer to finish treatment with bismuth or mercury rather than with arsphenamine
70-122	Probation	No treatment	6-12	Blood Wassermann every month if possible, at least every other month
123	Complete physical and neurologic examination, spinal puncture, and, if possible, fluoroscopic examination of cardiovascular stripe. Thereafter, yearly physical examinations, blood Wassermann every 6 to 12 months; if the two spinal fluid examinations above are negative, this need not be repeated.			

In this schedule arsphenamine means '606'. If '914' is chosen, the recommendation is to prolong the arsenical course and shorten the intervals and to give an individual dosage of 0.45 to 0.6 gm. for women and 0.6 to 0.75 gm. for men. The authors state that the arsphenamine-bismuth alternating system shown in the above table is essentially that used in recent years by the clinics co-operating in the analysis of records and published in 1929 for the guidance of practitioners.

As a modification of this course and a concession to those who believe that delay in the use of heavy metal in the treatment of early syphilis promotes neuro-recurrences, it is suggested that 3 series of 10 to 12 injections each of the arsenical drug may be given, and that, "2, 3, or even 4 injections before the end of the longer arsenical course" bismuth treatment be begun, the bismuth injections being continued throughout the interval between any two series of arsenical injections and on into the next arsenical series.

[It seems right to comment on these courses that for a number of weeks in the commencement the treatment is really intermittent and therefore inconsistent with the authors' views, since an arsphenamine preparation is excreted very rapidly, and for a number of days in each of these weeks no effective antisypilitic remedy is circulating in the patient. It is difficult to escape the conviction that continuous medication is secured most practicably by the administration of heavy metal, preferably bismuth in an insoluble form given from the commencement. The remark that it may be advisable to commence treatment with bismuth before the end of the longer arsenical course is significant in view of the fact that in the analysis of records on which the authors base their recommendations an important number of neuro-recurrences were found, their incidence being greatest in the clinic that practised the alternation

of arsenical courses with courses of heavy metal most strictly. In a recent article on another subject Udo J. Wile and W. M. Sams,⁸ of one of the clinics co-operating in the analysis mentioned above, say (p. 304), "yet a recent survey indicates that with early syphilis we have about 4 per cent neuro-recurrences during the first year of treatment". At the St. Thomas's Hospital centre, where both types of remedy are used concurrently, from the first the incidence of neuro-recurrence within the first year has not been one-fiftieth of 4 per cent, and the reviewer's strong belief is that the lower incidence is due to the use of heavy metal from the commencement. A probable explanation of the preventive effect of heavy metal so far as neuro-recurrence is concerned is that it provides a steady bombardment of the parasite, as distinct from the intermittent attack during the period that the only remedy being employed is an arsenobenzene compound, which is excreted comparatively rapidly.—L. W. H.]

Duration of Treatment.—A. Sézary,⁹ in an article on the length of time a syphilitic patient should be kept under treatment, deprecates the long periods recommended by Gougerot, Nicholas, and others, and thinks that four years is sufficient for the average case. Against the very prolonged treatment is the tax it makes on the patient's patience and resources. Also there is the risk of chronic arsenical intoxication and the damage to the gluteal muscles from the local injections of mercury or bismuth. Chronic nephritis is by no means uncommon in cases treated for very long periods. Further, it may happen that even the most prolonged treatment proves quite useless. In cases treated before the serum reactions have become positive Sézary thinks that the treatment might be even more curtailed. In all old-standing cases he insists on an examination of the cerebrospinal fluid, since the state of this determines the nature of the therapy. If the fluid is pathological, the indication is to treat with pentavalent arsenicals and malaria. [Sézary's paper has been reviewed as an illustration of current French practice, which differs from ours in the great length of time considered essential for the cure of even early syphilis. One is tempted to ask for the evidence on which are founded the views of workers who require such prolonged treatment. So far as the reviewer's experience and statistics go, steady treatment of an early case of syphilis for one-third the time considered necessary by Sézary affords such a very high percentage of permanently negative serum reactions that treatment of the average case for a longer period seems to be unjustified.—L. W. H.]

Pyrexial Treatment.—C. Richet, jun., J. Dublineau, and F. Joly¹⁰ report on a treatment of syphilis in which each dose of anti-syphilitic drug is supplemented by one of some preparation which will raise the patient's temperature. The researches of Weichbrodt and Jahnel, Schamberg and Rule, Frazier, and Bessemans have shown in animals that a general temperature of 43.5° C. during the primary incubation period will prevent development of the disease, and in animals with experimental syphilis cure of this is often effected by raising the general temperature to 42.5° C. The authors found in experimental animals that a subcurative dose of '914' when supported by a subcurative rise of temperature (by means of hot baths) effected the sterilization of the rabbit. These findings were confirmed in man. A variety of agents was used to cause a rise of temperature, but the anti-chancroid vaccine, *dmelcos*, given two hours after the dose of '914', appears to have been favoured, and the temperature six hours later was usually about 39° C. In an illustrative case 0.3 gm. of '914', supplemented by an injection of *dmelcos* two hours later, brought about disappearance of *S. pallida* from the discharge of a chancre within twenty-four hours. [Usually this result is obtained only with a dose of 0.45 gm. or higher.—L. W. H.] The authors will not say if the method should be used as a matter of routine in all

cases, or reserved for particularly resistant cases, for those in which the disease is progressing with abnormal rapidity, for malignant cases, or, with circumspection, for cases with renal disease.

J. V. Ambler and J. V. Van Cleve¹¹ agree with a number of other workers that non-specific protein shock therapy—by injections of milk or typhoid vaccine—is valuable in the treatment of interstitial keratitis. At the same time it must be admitted that, even with this form of treatment, many cases recover only slowly, and this has led the authors to try *malarial therapy* on 17 cases during the past six years. They quote papers by Dennie, Gilkie and Pakula (1931), by Schreeber, Marschesani, and a few other workers, all of whom have reported favourably on it. In their own cases the usual precautions and technique were employed and the number of paroxysms allowed was 3 in one case, 6 in three, 7 in two, 8 in four, and 9 to 14 in the remainder. The improvement in all was rapid and the final result very good. They recommend that the malarial treatment be followed, as in other cases treated by fever, by injections of antisyphilitic drugs.

Syphilis in Pregnancy.—The treatment of syphilis in pregnancy and its results are discussed by H. N. Cole and colleagues¹² in one of the papers resulting from an analysis of the pooled case records of five first-class clinics in U.S.A. The total number of pregnant syphilitic women in the records was 603, and they had 922 pregnancies, of which 607 have been studied as far as the result immediately after birth; data respecting the later histories are not available. The analysis showed that of women with negative serum reactions, whether treated or untreated, 81 per cent were delivered of living apparently healthy infants, while only 57 per cent of women with positive reactions had the same results. Treatment of various kinds before the fifth month resulted in 78 per cent apparently healthy infants, while treatment after the fifth month had only 61 per cent similar results. If a course of 10 arsphenamine and 10 bismuth or mercury injections was commenced before the fifth month, 91 per cent of the offspring were apparently healthy. A treatment with much arsphenamine but little mercury or bismuth gave 85 per cent good results if commenced before the fifth month, but only 55 per cent if commenced after that time. The authors' general conclusion agrees with that of the great majority of syphilologists—namely, that treatment throughout each pregnancy, and, above all, commenced before the fifth month, is by far the safest from the point of view of preventing transmission to the offspring.

Neurosyphilis.—P. A. O'Leary and A. L. Welsh¹³ in a paper on their observations of 984 cases of neurosyphilis treated with *malaria* during the past nine years show the great importance of earliness in application of the fever treatment. In a high proportion of symptomless cases with positive spinal fluid not responding to ordinary antisyphilitic treatment the pathological reactions of the fluid were reversed by a course of malaria. A. Kral¹⁴ points out that neurosyphilitics are left too long before fever treatment is applied. The results in clinically manifest general paralysis of the insane become rapidly worse with every month's delay, and undoubtedly the best effects of fever treatment are seen in pre-clinical cases with infections of more than five years' duration. In such cases ordinary anti-syphilitic treatment will not usually affect the reactions of the spinal fluid, but by malarial treatment Kyrle obtained complete reversal of pathological reactions in 24 out of 38 such cases. Kral agrees with Datner in recommending that the fever treatment be followed by arsenic and bismuth.

J. Wagner-Jauregg¹⁵ in a paper on methods of obtaining maximal benefit from malarial therapy, also emphasizes the importance of starting the treatment as early as possible. In cases where the fever is taking a dangerous course

a single small dose of quinine (3 to 5 gr.) will usually interrupt it for a few days, during which the patient has an opportunity of regaining his strength. If the fever does not recommence after a week or so, it can usually be stimulated to do so by giving a subcutaneous injection of milk or of sodium nucleinate (10 c.c. of a 5 per cent solution), but the best method is to repeat the malarial inoculation. In certain cases it may be advisable to give the 8 paroxysms in two series of four separated by an interval; this should not be longer than about six weeks, during which anti-syphilitic treatment is given. The split course should be prescribed for tuberculous subjects, as also for diabetics, those suffering from kidney, liver, or heart disease, patients over 60 years of age, patients who are under-nourished, and those who are over-nourished.

Pentavalent Arsenical Remedies in the Treatment of Neurosyphilis.—It is generally agreed that in cases where the syphilitic infection is more than about four years old and the spinal fluid is pathological, while the trivalent arsenical preparations usually fail to reverse the reactions, the pentavalent ones often succeed. The chief pentavalents employed for the purpose are tryparsamide and stovarsol. F. E. Cormia¹⁶ provides further evidence of the great value of tryparsamide in these cases. He remarks on the frequency with which a persistently positive blood serum reaction has been reversed in a case of neurosyphilis by tryparsamide and thinks it due to disappearance of *S. pallida* from the brain. L. H. Griggs and J. F. Schamberg¹⁷ report on a number of cases of neurosyphilis treated with intravenous injections of stovarsol. The solution was prepared by dissolving 1 grm. of the remedy in 9 c.c. of 4 per cent sodium hydrate and adding 11 c.c. distilled water. The initial dose was 0.5 grm., and succeeding ones given at weekly intervals were 1 grm. each. The treatment appeared to have a tonic effect and results generally are reported on as having been good.

REFERENCES.—¹*Bull. Johns Hopkins Hosp.* 1934, liv, March 3, 174; ²*Klin. Woch.* 1934, xiii, 550; ³*Bruxelles-méd.* 1934, xiv, 977; ⁴*Amer. Jour. Syph.* 1933, xvii, 473; ⁵*Bruxelles-méd.* 1934, xiv, 868; ⁶*Dermatol. Woch.* 1934, xcix, 929; ⁷*Ven. Dis. Inform.* 1934, xv, 149; ⁸*Amer. Jour. Med. Sci.* 1934, clxxxvii, March, 297; ⁹*Gen. Practice*, 1934, Jan.-March, 32; ¹⁰*Presse méd.* 1933, Oct. 25, 1649; ¹¹*Jour. Amer. Med. Assoc.* 1934, cii, 1553; ¹²*Ven. Dis. Inform.* 1934, xv, 83; ¹³*Jour. Amer. Med. Assoc.* 1933, ci, 498; ¹⁴*Med. Klin.* 1934, xxx, 898; ¹⁵*Klin. Woch.* 1934, xiii, 1028; ¹⁶*Brit. Jour. Ven. Dis.* 1934, x, April, 99; ¹⁷*Arch. Dermatol. and Syph.* 1934, xxix, 645.

A. Rendle Short, M.D., F.R.C.S.

Gumma of the Frontal Bone.—Plate LII illustrates a gumma of the frontal bone in a somewhat unusual position. These cases are not common nowadays and it is very important that they should be recognized. A dome-like swelling appears on the skull, which in a week or two softens; if neglected, it bursts through the skin, becomes secondarily infected, and leads to very prolonged suppuration and sequestrum formation.

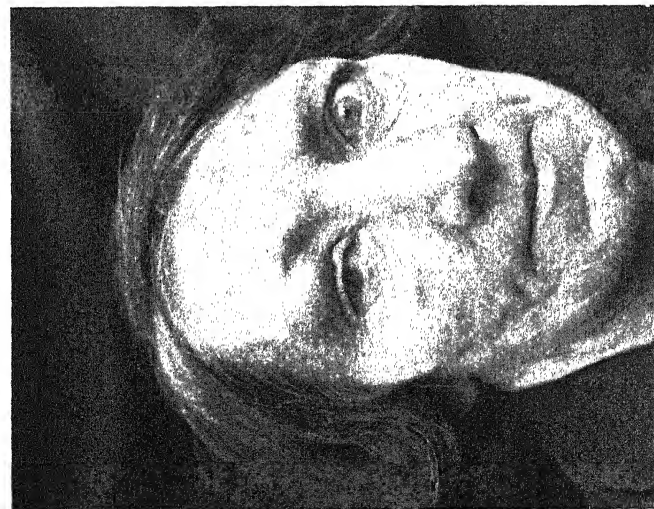
Months and years of discomfort and discharge may be saved by treating the patient with the usual remedies for tertiary syphilis before the gumma comes through the skin.

SYPHILIS, CARDIOVASCULAR.

A. G. Gibson, M.D., F.R.C.P.

M. J. Exner¹ makes a plea for the early diagnosis and adequate treatment of cardiovascular syphilis before the heart and vessels become seriously impaired. It is necessary to be alert for this possibility in any patient who is known to have had syphilis. A careful record of the case histories may often reveal such a condition. Clinical and X-ray examinations of the cardiovascular system and repeated Wassermann tests are advised. The routine of treatment suggested is intermittent courses of one of the arsenical compounds with interim courses of bismuth or mercury with iodide.

PLATE LII—GUMMA OF FRONTAL BONE
(A. RENDLE SHORT)



The question of the efficacy of treatment on the progress of syphilis of the cardiovascular system would appear, on the evidence of C. W. Barnett,² not yet to be settled, and the author reviews the evidence. In 1911 in 25 patients Bruce estimated the average duration of life from the onset of symptoms to be 5 $\frac{3}{10}$ years. Leschke's limit was 2 to 3 years, Hubert's 1 $\frac{1}{2}$ to 3 years, and Scott's 2 years. Many patients, however, without treatment live many years, and he gives the instance of a fisherman discovered to have an aneurysm in March, 1916, who, with very little treatment and engaging in arduous labour, died 16 years afterwards. Another case in a woman was observed for 12 years and then lost sight of. Conybeare's series of 22 cases of aneurysm of the aorta showed that the length of life was 15 months in the untreated and 24 in the treated. Cotton's series again showed the same, a slightly longer life for treated cases. Moore, Dangle, and Reisinger estimated that the average duration of life increased from 27 months to 68 months according to the efficacy of treatment. Figures on the efficacy of treatment in congestive cardiac failure show more indication that life can be prolonged. The author's contention is probably correct in that convincing proof is not yet available, but the impression of those who have analysed series of cases would appear to be that specific treatment should be undertaken, and there is no doubt that those cases who have undergone thorough courses of treatment show after death a type of aorta which is not seen in the untreated cases. There is much more scarring and contraction in the treated case, though the dilatations are unaffected.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, ci, July 29, 408; ²*Arch. of Dermatol. and Syph.* 1933, xxviii, July, 1.

SYPHILIS AND CIRCUMCISION. (*See* PENIS, SURGERY OF.)

SYPHILIS, GASTRIC. (*See* STOMACH, VARIOUS SURGICAL AFFECTIONS OF.)

SYPHILIS OF THE LUNG. (*See* LUNG, SYPHILIS OF.)

TESTIS AND APPENDAGES, SURGERY OF.

Hamilton Bailey, F.R.C.S.

TESTICLE.

The Descent of the Testis.—The riddle how and why the testis leaves the secluded place of its origin near the kidney and migrates to its extremely vulnerable resting-place in the scrotum (*Fig. 52*) has continued to puzzle inquiring minds since John Hunter described the descent of the organ in 1762. The problem is all the more complex because testicular migration is not a constant developmental event throughout the animal kingdom. In creatures up to, and including, birds and reptiles, the testes remain in the upper abdomen. The same condition persists in primitive mammals. Even a few animals high in the phylogenetic scale, such as the whale, the elephant, and the ant-eater, accommodate their testes within the abdomen throughout life (E. Andrews and Bissell¹). In man and those animals where the testis is wont to descend, arrested descent is followed by arrested testicular development. In other words, unless the testis is housed in the scrotum it fails to mature and spermatogenesis is imperfect and transitory, if it occurs at all.

It has been suggested that to mature and function the testis must be kept at a temperature one or two degrees lower than other viscera; moreover, that the scrotum is to the testis a thermo-regulating mechanism. In support of this subtle theory may be cited: (1) The scrotum, even in the most obese,

contains not a particle of fat. (2) A ram with its serotum insulated with a tea-cosy becomes, after a few weeks, sterile, but regains its powers soon after the insulating material has been removed. (3) If, by a surgical operation, a dog's testes are placed within the abdomen, it is not long before they undergo degenerative changes with loss of spermatogenesis. In five weeks they are damaged permanently, but if before this time they are replaced in the serotum by a second operation, they regain their pristine activity.

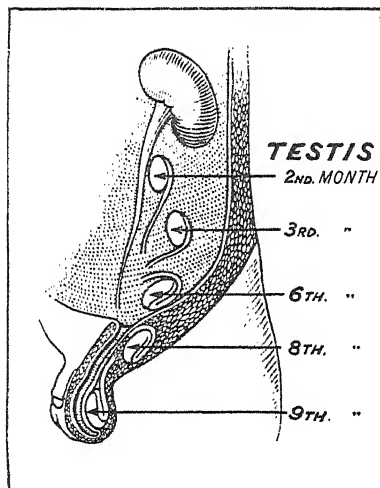


Fig. 52.—The migration of the testicle. It should reach the scrotum shortly before birth.

In a few animals, notably the rabbit, hedgehog, and the bat, the testes only migrate to the scrotum during the breeding season. Perhaps this knowledge is the foundation of the widespread belief that in boys undescended testes will descend at puberty. Now and again this does occur. C. B. Drake,² a medical officer to a school, has observed it several times. The bulk of evidence shows that late descent is rare, and consequently it is unjustifiable to wait, for to wait in vain is to rob the patient of an excellent chance of a successful orchidopexy. To be successful regularly, *orchidopexy* should be performed between (about) the seventh and eleventh years. Some surgeons advocate an earlier operation, but all are agreed that after the thirteenth or fourteenth years results are poor. Improved technique and operating at the correct time has, within the past few years, transformed the operation

of orchidopexy from a procedure full of disappointments into a safe and highly satisfactory measure, carrying, at a low estimate, 75 per cent of anatomical successes (A. E. Roche³). C. G. Burdick and L. B. Coley,⁴ in analysing 137 cases, found the result was excellent in 123.

Torsion of the Testis.—Torsion of the testis occurs with equal frequency in the fully-descended and the maldescended organ. The essential factor which allows twisting of the spermatic cord to take place is absence of the scrotal ligament, a remnant of the gubernaculum, which normally anchors the organ within its coverings (V. Bonono⁵). The exciting factor is usually an irregular contraction of the cremaster muscle. A characteristic diagnostic point detailed by V. O'Connor⁶ is that there is swelling of the scrotal contents beginning immediately. This swelling gradually increases for twelve to twenty-four hours, when it ceases. When the diagnosis of torsion is tolerably certain and the patient is seen early in the attack, manipulation should be attempted.

R. E. Smith⁷ reports the following case: On Oct. 17, 1933, a schoolboy at Rugby was awakened at 5.30 a.m. with excruciating pain referred to a point one-third along a line joining the anterior superior iliac spine to the umbilicus. He was very restless, and writhing in agony at 6.45 a.m. The right testicle was of the size of a hen's egg, and moderately tender. On rotation of his testicle 180° from his left to right he volunteered the statement "That's better", but it required a further 180° before complete relief was obtained. He was

PLATE LIII

PREVENTION OF TORSION OF THE TESTIS

(B. J. OTTENHEIMER AND G. Y. BIDGOOD)

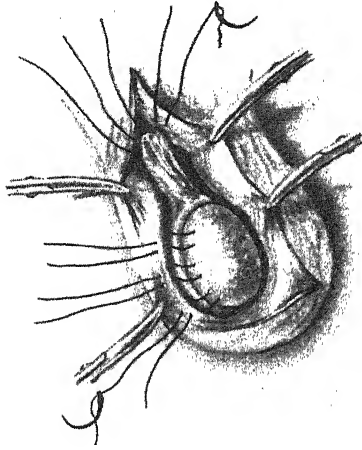


Fig. A.

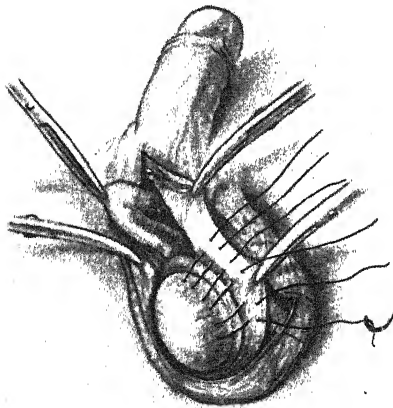


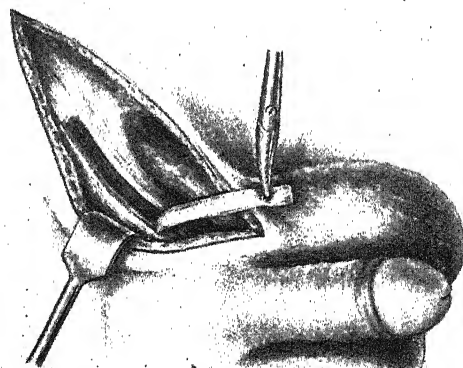
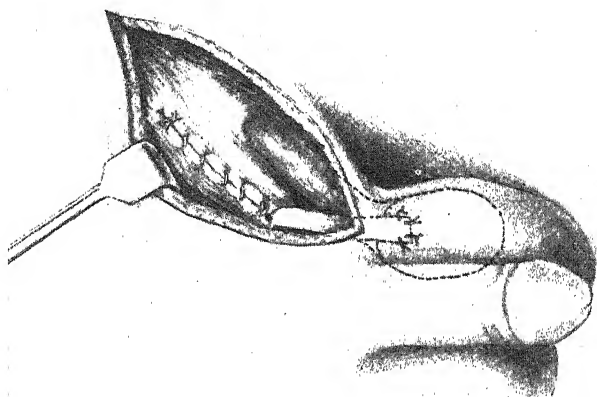
Fig. B.

Method of anchoring the testis with sutures to prevent recurrence of torsion. *A*, Lateral mattress sutures; *B*, Medial mattress sutures of the septum dartos. The sutures are passed in each case through the tunica albuginea. Fine silk or thread is perhaps the best material to employ in order to make the anchorage permanent.

Re-drawn from the 'Journal of the American Medical Association'

PLATE LIV—VARICOCELE

(J. J. LONDRES)



Londres' method of suspending the testis with fascia in the treatment of varicocele.

left to hold the testicle in position for an hour. Three hours later the testicle was normal in size.

In later cases, or when manipulation is not quickly and entirely satisfactory, the testis should be exposed through an inguinal incision. The skin is best prepared with picric acid, for iodine burns and irritates the skin of the scrotum. The operation can be conducted readily under a local anæsthetic, especially if a preliminary dose of morphia has been given, or evipan can be used. The testis is delivered through the wound. If, on untwisting the cord, there are any signs of a return of the circulation, an attempt should be made to preserve the organ and to fix it by suture in an anatomically correct position. Experience teaches us that in the majority of instances when untwisting has been performed after the sixth hour atrophy of the testis ensues eventually, although it takes several months to become manifest. Therefore, if the testis appears blue-black and lifeless, the best course is to ligate the cord securely and remove the useless organ.

E. J. Ottenheimer and G. Y. Bidgood⁸ describe an operation for the prevention of recurrence of torsion of the testis. It is abundantly clear if torsion has occurred once it will occur again, for unless there is an anatomical anomaly in the suspension of the testis within its coverings, torsion is impossible. If this anomaly obtains on one side, it is reasonable to suppose that it is likely to exist on the other. Consequently, these authors recommend fixation in order to save the remaining testis from a similar fate when its fellow has been removed on account of torsion with gangrene. The technique is illustrated in *Plate LIII*. Mattress sutures of fine silk are used to fix the tunica albuginea to the septum on the one hand and the lateral wall of the scrotum on the other. This anchors the back of the testis firmly to the inner lining of the scrotum. Thenceforth intrascrotal rotation of the testis is impossible.

Hydrocele.—The injection treatment of hydrocele is favourably reported upon on all sides. The best sclerosing agent in this instance appears to be quinine-urea-hydrochloride (3-5 c.c.). Injection is effective particularly in thin-walled hydroceles. The hydrocele is tapped. After washing out the sac with more saline the solution is introduced into the hydrocele sac. The scrotum is then massaged so that the sclerosing agent is distributed evenly throughout the interior of the sac. L. Blavier⁹ finds that one injection is usually effective. Although the fluid in the sac reaccumulates, and at the end of the week the hydrocele appears to be as big as before, within three or four weeks the exudate is generally absorbed. Other authors recommend aspiration of the exudate and reinjection if necessary. Other solutions recommended are quinine-urethane 2-3 c.c. (R. Maingot¹⁰) and 10 c.c. of sterile solution containing 2 gr. of quinine bihydrochloride and 1 gr. of salicylic acid (B. L. Sharma¹¹).

Varicocele.—J. J. Londrès¹² emphasizes that the efficient treatment of varicocele is still a most important question in military circles. Some surgeons prefer radical operation, while others are opposed to surgery except in exceptional cases. Suspensory bandages, he says, are inefficient and unsatisfactory. He agrees that to excise the varicose veins often leads to atrophy of the testis and hydrocele. In a large experience of these cases among Brazilian sailors Londrès has employed a method of suspending the testes by a strip of fascia, the technique of which is shown in *Plate LIV*. The fascial strip does not stretch and consequently suspends the testis permanently. Thus supported the testis ceases to be painful, and the dilated veins tend to assume more normal proportions. The opening made in the fascia of the external oblique is sutured with due regard to leaving the external abdominal ring of a proper diameter.

Acute Gonococcal Epididymo-orchitis.—Z. M. Kau¹³ gives the following advice. In all cases conservative methods should first be employed. The

scrotum and its contents are elevated and mobilized. The application of heat—diathermy is but another way of applying heat locally—certainly hastens resolution, but it fails to soothe the pain, and sometimes the patient objects. An ice-bag is more comforting, and does not influence the course of the disease. Very favourable reports are received on the intravenous administration of *calcium chloride*. The chief benefit derived from the injections is the rapid relief of pain; the mechanism of its action is not clear. In a large percentage of cases the above treatment is all that is necessary.

Epididymotomy (decompression of the epididymis) is an operation which is gaining in favour. The chief advantages of the method are immediate relief of pain and prevention of chronicity and male sterility. The testis is exposed through an incision in the scrotum. Multiple punctures are made with a small tenotome through the fibrous capsule over the indurated and enlarged epididymis. If free pus is encountered, that opening is enlarged. By this technique one is less apt to endanger the tubules of the epididymis. The tunica vaginalis and the skin are sutured, leaving a small drain in the lower end of the wound. The indications of the operation are: when pain persists after forty-eight hours of palliative treatment; in bilateral cases; in recurrent cases; and when resolution of the inflammation is unusually slow.

Malignant Disease of the Testis.—A. Peterson and W. E. Costolow¹⁴ rightly insist that in cases of malignant testis X-ray treatment is indicated whether or no radical surgery has been employed. In cases of teratoma of the testis the Aschheim-Zondek test for pregnancy is sometimes positive. Peterson and Costolow consider that this test may be helpful in managing these cases, especially in regard to the amount of radiotherapy required.

SEMINAL VESICLES.

Seminal Vesiculitis.—Chronic urethritis is often maintained by infection lurking in the vesicle. The diagnosis is made by rectal examination, when an enlarged tender swelling in the position of the vesicle can be palpated (H. Bailey and R. J. M. Love.¹⁵)

An important point in the diagnosis of seminal vesiculitis frequently overlooked is that urine voided naturally may be perfectly clear. If the vesicle can be reached by a finger in the rectum and stripped vigorously the urine voided after stripping will contain worm-like casts (see *Plate XLII, A*, p. 385) of the vesicle. In about 80 per cent of cases cultures of this material reveal pus-forming organisms.

If the condition does not respond to stripping by a finger in the rectum, lavage of the vesicle often rids the patient of the infection. A. L. Wolbarst¹⁶ says that vasotomy should not be thought of as a last resort; it should be performed early, in fact as soon as it is evident that routine treatment of the posterior urethritis is not meeting the needs of the situation. The cord is exposed by a small incision over the external abdominal ring. The vas is isolated and cannulized with a hollow needle. The vesicle is washed out with a 5 per cent solution of argyrol or a 1 per cent solution of merurochrome.

B. Valverd ¹⁷ says as much as 12 c.c. can be injected. The vas is left temporarily fixed in the subcutis, so that it may be re-exposed and the operation repeated four times or more in the course of a week, during which time the patient is confined to bed. Valverd  stresses the question of rest in bed after lavage of the vesicles as of fundamental importance. After the final injection the vas is allowed to drop back.

Seminal Vesiculography.—It is sometimes necessary to know if the common ejaculatory ducts are patent. This information can be obtained by catheterizing the common ejaculatory ducts through a special posterior

urethroscope. This is a very delicate and difficult procedure requiring special instruments and experience in their use. The same information can be obtained more easily by vasotomy and the injection of an opaque medium such as lipiodol (see *Plate XLII, B*, p. 385).

VAS DEFERENS.

Vasectomy.—When it is absolutely necessary to prevent further pregnancies on account of health, vasectomy is recommended by C. A. Owens¹⁸ as an operation of choice to be considered by those husbands who would prefer to undergo a safe, simple, and economical procedure on themselves, rather than submit their wives to a major operation.

Vasectomy is also recommended by Owens in cases of chronic posterior urethritis to prevent the development of epididymo-orchitis.

In *tuberculous epididymo-orchitis* ligature and division of the vas on the affected side, and the opposite vas in addition when either seminal vesicle is involved, is a sound measure of preventing spread of the disease. This slight operation should receive early consideration and may be looked upon as almost a necessary adjuvant to the conservative treatment of genital tuberculosis (H. Bailey and R. J. M. Love¹⁹).

REFERENCES.—¹*Jour. of Urol.* 1934, xxxi, June, 839; ²*Jour. Amer. Med. Assoc.* 1934, March, 759; ³*Clinical Jour.* 1934, April; ⁴*Ann. of Surg.* 1933, Oct., 495; ⁵*Arch. ital. di Chir.* 1933, July, 197; ⁶*Surg. Gynecol. and Obst.* 1933, lvii, 242; ⁷*Clinical Jour.* 1934, June; ⁸*Jour. Amer. Med. Assoc.* 1933, July 8, 116; ⁹*Jour. de Chir. et Ann. Soc. belge de Chir.* 1933, xxxii, 334; ¹⁰*Post-Grad. Med. Jour.* 1932, viii, 307; ¹¹*Ind. Med. Gaz.* 1929, Oct., 570; ¹²*Ann. of Surg.* 1934, Jan., 185; ¹³*Chinese Med. Jour.* 1933, xlvii, 740; ¹⁴*Urol. and Cutan. Rev.* 1933, Oct., 720; ¹⁵*Short Practice of Surgery*, 1935, 2nd ed.; ¹⁶*Amer. Med.* 1933, Sept., 385; ¹⁷*Urol. and Cutan. Rev.* 1933, xxxvii, Sept., 595; ¹⁸*Nebraska State Med. Jour.* 1933, Sept., 335; ¹⁹*Short Practice of Surgery*, 1935, 2nd ed.

John Fraser, Ch.M., F.R.C.S.Ed.

Cryptorchidism.—The problem of cryptorchidism continues to receive attention. There is universal agreement that, in order to avoid the disaster of atrophy, the organ must be placed in the scrotum at some time previous to puberty, the replacement being secured in such a way that the vascular structures are preserved relatively entire.

In the MEDICAL ANNUAL of 1929 (p. 478) the work of Hannerstein was reviewed. He claimed that to ensure the best results the testis should be restored to its normal position as soon after birth as possible. His work has not proved of practical value, because operation at an early period appears to be associated with risks of atrophy, and the long-established practice has therefore been continued of recommending operation at some time between the tenth and the fourteenth year.

Of the various operations which are practised to secure the desired result the Torek procedure is well spoken of. The details were described in the MEDICAL ANNUAL of 1933 (p. 479), but in brief it may be said that the operation consists in temporarily uniting the scrotum of the affected side to the skin of the thigh on the same side, in this way securing adequate fixation with some degree of traction upon the testis by suturing it to the deep fascia of the thigh. Some months later the temporary union is severed and the contour of the scrotum restored. A. E. W. Ada¹ describes the advantages of the operation; he has modified it from a two-stage to a three-stage procedure, the variation being applicable when the testis is retained at a high level and the related structures are shortened to such an extent as to make immediate replacement impossible. The stages are: (1) To bring the testis to the level of the external ring; (2) Three months later to carry out the first stage of the Torek operation;

and (3) At the end of a further three months to complete the Torek procedure by detaching the testis and scrotum from the thigh.

V. S. Counsellor² describes his experience of various types of operation as practised in 100 cases. They included the Bevan operation, the Torek operation, and orchidectomy. It is his final conclusion that the Torek operation proved the most satisfactory, yielding a successful result in 93.3 per cent of the cases.

L. Moskowitz³ draws attention to an aspect of cryptorchism which may be of considerable practical significance in relation to the association of partial hermaphroditism with the more extreme degrees of the testicle error. It is evident that the error is encountered in those cases in which the testes are retained within the abdomen. The subject is fully discussed from the embryological point of view.

REFERENCES.—¹*Amer. Jour. Surg.* 1934, Jan., 133; ²*Jour. of Urol.* 1933, xxx, 327; ³*Arch. f. klin. Chir.* 1934, April, 445.

TETANUS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The MEDICAL ANNUAL has almost every year, during and since the war, drawn attention to advances in the treatment of tetanus. A. P. Klemmer and E. S. Crossland¹ discuss the subject. The highest mortality was encountered in those patients who developed tetanus between the fifth and tenth days after injury (68 per cent). The mortality percentage was less than half in the cases which developed tetanus within five days after occurrence of the injury. Cases are mentioned following vaccination; the infection was apparently not from contaminated vaccine but from the soiling of partially healed vaccination wounds. One fatal case occurred following the injection treatment for hemorrhoids. Klemmer and Crossland believe from their investigations that the intrathecal injection of tetanus antitoxin is not free from danger. The best results were obtained when the antitoxin was introduced by both the intramuscular and intravenous routes. The study of the series of cases under review appears to indicate that the ideal dose of antitoxin in the first twenty-four hours is between 25,000 and 40,000 units. Doses less than 20,000 units appear inadequate.

F. W. Taylor² deals with the treatment of acute tetanus. He emphasizes the well-known fact that the prophylactic use of serum has achieved brilliant results. Once the toxin is combined with the nerve-cell, antitoxic serum cannot displace the toxin. Antitoxin neutralizes only that toxin which is free in the blood or tissues. Death results from exhaustion, spasm of the glottis, and convulsion, but not from the neurologic lesion produced by tetanus toxin.

The treatment logically falls into three phases: (1) Treatment of the local focus; (2) Administration of appropriate sedatives and general supportive therapy; and (3) Administration of specific antitoxic serum. However healed the local wound may appear, it should be freely excised. It is the distributing focus of the toxin. The presence of a foreign body, however small, is of importance. Its presence enhances local production of toxin and bacterial growth. As regards sedatives, Taylor recommends the use of sodium amytal or avertin. Intravenous and subcutaneous administration of dextrose solution and normal saline are of invaluable aid. As regards the administration of serum, he believes that no particular route holds the advantage over any other; the intravenous and intramuscular routes, however, make the antitoxin immediately available. Clinically no advantage was got by using the intraspinal route, but it has the disadvantage of delayed absorption; 30,000 to 60,000 units of serum are suggested as a suitable amount when the patient is first seen. The intramuscular route is on the whole the most suitable.

H. I. Vener, A. S. Bower, and J. E. McKillop³ find that compound fractures with infection developing tetanus give the highest mortality rate (100 per cent). Post-operative tetanus results in the third highest mortality (71.4 per cent). The three greatest causative factors of tetanus—namely splinters, puncture wounds, and abrasions and lacerations—give a combined mortality rate of 58.5 per cent. The paper is largely a statistical inquiry. Some of the conclusions are interesting; for example, tetanus about the face was found to have a lower death-rate than tetanus of the extremities. Tetanus originating in the proximal parts of the extremity was more fatal than if from the distal portions. It is also stated that there was no definite relationship between the mortality rate and the incubation period. This statement is opposed to the general consensus of opinion. It is stated that if a patient can be kept alive for at least three days, and, if possible, for nine days, the mortality rate diminishes rapidly after these periods. Early administration of antitoxin in massive doses of not less than 90,000 units is advocated.

H. S. Meade⁴ administered sodium amytal with success in a case of tetanus. He draws attention to the fact that this drug seems to control the spasms and gives mental quietude to the patient while the curative serum is taking effect.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1934, clxxxvii, May, 700; ²*Jour. Amer. Med. Assoc.* 1934, March 24, 895; ³*Calif. and Western Med.* 1933, Dec., 374; ⁴*Irish Jour. Med. Sci.* 1934, Jan., 37.

THROMBO-ANGIITIS OBLITERANS. (See also BLOOD-VESSELS, SURGERY OF.) *A. G. Gibson, M.D., F.R.C.P.*

G. E. Brown¹ gives a full clinical account of thrombo-angiitis obliterans. There are four common clinical types: (1) The compensated type with mild claudication or fatigue on exercise of the muscles of the foot or leg. (2) The slowly progressive type with improvements and relapses in which cases have been observed up to fifteen years without ulceration or gangrene. (3) The type with limited gangrene such as trophic ulcers which heal and frequently relapse. In these cases the ulcers are often induced by mild trauma such as the application of irritant antiseptics; they are often, therefore, not diagnosed. (4) An acute progressive type, frequently bilateral, with trophic ulcers, gangrene, and excessive pain. Other types are described, one of which is interesting in that it is accompanied by no symptoms suggesting arterial insufficiency. In others there is severe pain without either ulceration or gangrene, together with numbness, burning, and other forms of parasthesia. In the symptoms and signs, in addition to those mentioned by De Takats and Mackenzie (see below), the author stresses small ulcers at the margin of the nails, and secondary infection. The pain is constant in these cases, whereas with claudication alone it is only present with exercise. The growth of the nails is impaired and the skin fissured, dry, or thickened. The ischæmia may affect a nerve and give a picture of neuritis. Ninety-eight per cent of patients were males and 28 per cent of these were Jews, though in comparison with an earlier series this percentage of Jews is lower. The errors in diagnosis are due to mistaking this condition for arthritis, fallen arches, and infection. The amount of the vasospastic element is determined by injecting anti-typhoid vaccine intravenously and observing the temperature of the digits affected and of the mouth every thirty minutes. If the surface temperature of the digits has increased to at least twice as much as that of the temperature of the mouth, it is considered that a fairly high degree of vasoconstriction in addition to the occlusion is present, and if a temperature of at least 29° C. is obtained in the skin of the affected digits, satisfactory ability for vasodilatation is assumed to exist. The value

of sympathetic ganglionectomy is said to be the high degree of protection it affords to the extremities. Relapses occur when the circulation in the parts affected is temporarily at a low level. For the relief of pain in trophic ulcers a small incision followed by alcoholic blocking of the sensory nerves is recommended. Out of 656 patients followed up, it is clear that if a diagnosis can be made before the onset of gangrene the chances of the subsequent loss of a limb are reduced if controlled medical and protective measures can be employed. The relief of pain with healing in those cases with ulcer is successful in 80 per cent.

G. de Takats and W. D. Mackenzie² give an account of the diagnosis and treatment of circulatory disturbances of the extremity. The outline of their examination in these cases includes the peripheral pulse as felt below Poupart's ligament, in the popliteal fossa, and on the dorsum of the foot. In the upper limb the subclavian, cubital, ulnar, and radial pulses are taken. The two sides are compared and any changes noted. The absence of the pedal pulses is not infrequently seen in older patients, especially men, though no subjective or other signs are seen. An absence of pulse does not necessarily mean that the blood is not running through the artery. Secondly, the surface temperature is estimated at various levels, either with a thermocouple galvanometer or with a mercury skin thermometer. Important indications are a sudden drop in the temperature as the limb is tested towards the periphery, and marked differences between the two sides. Thirdly, postural changes of colour such as redness on lowering and pallor on elevation together with pallor on exercise are signs of diminished arterial inflow. In older patients they may not have any serious significance. Fourthly, the histamine flare, which is a reflex vasodilatation of the arterioles, occurs when a solution of histamine acid phosphate is injected intradermally, 0.1 c.c. of a 0.1 per cent solution being used. This flare is absent in diminished local blood-pressure when arterial spasm is present or when the cutaneous nerves have degenerated after peripheral injury. Its importance lies in giving the lowest level of safe amputation in gangrene, in ascertaining the improvement or not during treatment, and in giving a sign of early diagnosis. Fifthly, the shape and height of the curve with a rising external pressure is determined by Pachon's oscilometer, which indicates whether narrowing or occlusion of the main vessels is present. Sixthly, the X-ray examination may determine calcification or by the injection of opaque substances may show up the pattern of the arterial bed. Other methods of examination, though not included as routine observations, are discussed. When amputation is considered it has been undertaken at the lowest possible limit as indicated by the tests, and in no case has there been a necessity for re-amputation. A useful summary is given of the peripheral vascular syndromes that are met with in clinical work.

E. M. Landis and J. H. Gibbon³ suggest that warming of the forearms in water at a temperature of from 43° to 45° C. for thirty-five minutes is a simple and unobjectionable method of producing vasodilatation in the lower extremities. If, after this procedure the surface temperature of the toes rises above 31.5° C. obliterative structural disease of the arteries of the lower extremity is absent. This method has been tested out in a series of patients, both with and without evidence of thrombo-angiitis obliterans, and the results are the same by this method as by others used for vasodilatation—namely, the intravenous injection of typhoid vaccine, the use of spinal anaesthesia, and the anaesthetization of the posterior tibial nerve.

G. W. Pickering,⁴ in a paper on the clinical recognition of structural disease of the peripheral vessels, points out that the value of Pachon's oscilometer is to confirm the presence of arterial pulsation and to detect it in arteries such

as those of the calf that lie too deep for palpation. It can also be used as an objective test of the degree of pulsation on the two sides. The readings, however, are subject to occasional error. He discusses also the reactive hyperemia test, which concerns the rapidity with which the flushing of the vessels reaches the periphery in a warm limb after the circulation has been arrested for five minutes. If the limbs are cold, or the patient is subject to Raynaud's disease or acrocyanosis, the appearance of the flush is delayed. It is necessary in performing the test to see that the limb is empty of blood before arresting the circulation.

REFERENCES. ¹*Surg. Gynecol. and Obst.* 1934, lviii, Feb., 297; ²*Ibid.* March, 655; ³*Arch. of Internal Med.* 1933, lii, Nov., 785; ⁴*Brit. Med. Jour.* 1933, ii, Dec. 16, 1106.

THROMBOCYTOPENIC PURPURA. (See BLOOD DISEASES.)

THROMBOSIS. (See BLOOD-VESSELS, SURGERY OF.)

THYROID GLAND. (See also ENDOCRINE SYSTEM, INTEGRATION OF.)

Sir Walter Langdon-Brown, M.D., F.R.C.P.

Iodine and the Thyroid Gland.—C. R. Harington,¹ whose own researches have added so much to our knowledge of the chemistry of the thyroid gland, reviews the whole question of iodine in the treatment of thyroid disease. It is said that a soup made from seaweed was employed by the Chinese in the treatment of goitre many centuries before Christ, and certainly burnt sponge has been used in this country since the middle of the eighteenth century. In 1819 Fyfe showed that the recently discovered element, iodine, was abundantly present in the ash of sponges, and in the same year Coindet used it therapeutically for goitre. It is unnecessary to recount the fluctuation of opinion during the century that followed; the modern epoch begins with Marine's discovery in 1922 that in general the iodine concentration in the thyroid is inversely proportional to the degree of glandular hyperplasia. Thus administration of iodine would prevent or lead to the involution of thyroid hyperplasia. These observations seem to Harington to afford the only reasonable basis for iodine therapy in Graves' disease. Plummer's view that the thyroid in this disease produced a secretion which was toxic owing to its deficiency in iodine is disproved by Harington's study of the derivatives of thyroxine, particularly of those deficient in iodine. Harington favours Kocher's theory of a 'thyroid diarrhoea' in Graves' disease, the active principle being synthesized rapidly by the gland and immediately released; the cause of the 'diarrhoea' being outside the gland itself. [Perhaps in the pituitary thyrotropic hormone?—W. L.-B.] He agrees with those who attribute the temporary benefit of iodine to its increasing the colloid which is typical of the resting gland. The pressure of this retained secretion upon the alveolar cells diminishes the outflow from them during the period when these cells are adjusting themselves to the rapid involution.

In the discussion which followed T. P. Dunhill gave as his opinion that in spite of the claims made for medical treatment, elimination of sepsis, or X-ray treatment, the number of severe cases of Graves' disease was increasing, and he was inclined to attribute this to the indiscriminate administration of iodine in the earlier stages.

A. B. Gutman and others² found that di-iodotyrosine had no specific difference from other forms of iodine in the treatment of hyperthyroidism. This is hardly surprising since A. B. Anderson, C. R. Harington, and D. Murray Lyon³ report that 3:5 di-iodothyronine or di-iodotyrosine, in doses of 50 to 75 mgrm. daily, is capable of relieving the symptoms of a high grade of myxœdema. It

is readily obtainable by a synthetic method in a state of purity and is perfectly stable. It is, in fact, the penultimate product in the synthetic preparation of thyroxine. They regard it as superior to the normal biological product.

Iodine Content of the Blood.—G. M. Curtis and others¹ regard the significance of the blood-iodine in thyroid disease as similar to that of the blood-sugar in diabetes and to that of the blood-calcium in parathyroid disease. It is raised in hyperthyroidism and lowered in hypothyroidism. It would seem that the level of the blood-iodine is controlled by thyroid activity. There are corresponding changes in the urinary excretion of iodine.

Goitre.—P. H. J. Turton,⁵ who has for some years been making a careful study of endemic goitre in Derbyshire, concludes that no one agent can be regarded as responsible. Impure and unprotected sources of water-supply, leading to gastro-intestinal infection, possibly of a specific kind, must have played a large part in the past. But there are so many variations within the same region of water-supply that it is certain that there are other factors in operation apart from any question of puberty or sex. Food-supply in relation to mineral imbalance, deficiency of iodine or of vitamin-content, all no doubt play their part. Simple goitre, then, is a misnomer: the problem of causation is by no means simple. Turton points out the very definite relationship between goitre and the limestone district, while in the triassic region in the south goitre is almost entirely absent. He is definitely of opinion that there is no evidence that iodine insufficiency is, or has been, a principal factor in the genesis of this disease, at any rate in Derbyshire. Attention to the principles of public and personal hygiene and sanitation, and to the principles of nutrition, the substitution of good water-supplies in place of those of great impurity, both as regards their mineral and animal content, have all played a large part in abolishing or greatly diminishing the 'Derby-neck'. In the discussion which followed, speakers were inclined to lay more emphasis on iodine deficiency, at any rate in other areas in which goitre is endemic.

Hyperthyroidism.—The literature of the year chiefly consists either of isolated observations or of statistical tables of the results of different methods of treatment. The following appear to be the chief points of interest.

ETIOLOGY.—Experimental exophthalmos and hyperthyroidism has been produced in guinea-pigs by H. B. Friedgood⁶ by injections of anterior pituitary extract, which is confirmatory of other observations as to the existence of a thyrotropic hormone in the anterior pituitary.

J. S. Goodall and Lambert Rogers⁷ emphasize the importance of emotion in the production of thyrotoxicosis. This factor, clearly recognized by several writers during and immediately after the War, has perhaps been somewhat neglected of late.

SIGNS.—C. Lian and others,⁸ in calling attention to the value of a continuous murmur heard over the thyroid in cases of Graves' disease as opposed to other thyroid affections, maintain that it may only be heard at the edge of the upper pole of the lateral lobes. When very marked it may be accompanied by a palpable thrill. They regard these points as practically pathognomonic.

A. Fina⁹ found that Read's formula for determining the basal metabolic rate was reliable in 87 per cent of his cases. He used his later formula:—

$$\text{B.M.R.} = 0.683 (\text{PR} + 0.9 \text{ PP}) - 71.5,$$

where PR = pulse-rate and PP = pulse-pressure.

F. W. C. Northfield¹⁰ finds a marked lowering of the threshold for electrical stimulation of peripheral nerves, which is much improved by operation. If it is not, this may be an indication that further treatment may yet be necessary. A markedly low threshold (in the region of 0.6 ma.) is evidence of latent tetany

and may lead to post-operative frank tetany. Hyperpnea and pyrexia are the chief factors in latent tetany. The former should be treated by rest and the latter by cooling in order to prevent post-operative tetany.

It is rather curious that M. A. B. Brazier¹¹ finds, on the other hand, that the resistance of the whole body to the passage of an alternating current is actually increased in thyrotoxicosis.

Atypical Hyperthyroidism.—Ginsburg,¹² in calling attention to the influence of emotional shock and strain in inducing thyrotoxicoses, says that the constitutional symptoms closely resemble neurotic manifestations, and in the absence of thyroid enlargement and exophthalmos have been mistaken for primary neuroses. While freely admitting the importance of looking for any evidence of hyperthyroidism, it would seem to the reviewer that, on Ginsburg's own showing, such cases can fairly be classed as neurotic in origin.

F. W. Rankin and S. F. Haines¹³ mention as difficulties in the diagnosis of masked thyrotoxicosis, that it may arise in conjunction with fatigue states, essential hypertension, Parkinson's syndrome, and chronic encephalitis. Emergency cases of heart failure may be due to such hyperthyroidism, and if the condition be recognized, dramatic results from treatment are often obtained. Crises of severe gastro-intestinal disorder may also be thus caused. This last group of symptoms may be due to the combined hypermotility of the gastro-intestinal tract and acidity to which J. W. Shirer¹⁴ has called attention.

Iodine-resistant Hyperthyroidism.—E. B. Potter and W. R. Morris¹⁵ conclude that the prolonged use of iodine is responsible for the production of an iodine-resistant state in 40 per cent of the cases which show this reaction. In the remaining 60 per cent iodized salt may be responsible, though they admit its great value in goitrous areas. Fractional operations provide the safest method for the removal of the iodine-resistant thyroid.

Graves' Disease and Pernicious Anæmia.—E. Meulengracht and S. J. Hartfall¹⁶ report 3 new cases of Addisonian anæmia associated with Graves' disease and review them together with 8 cases previously recovered. All the cases occurred in females and all had achlorhydria. The clinical picture was not obvious, for the patients were generally thin and the pernicious anæmia was usually revealed only by the blood examination. The anæmia had no relation to treatment and may best be explained upon the basis of a gastric secretory defect brought about by the thyrotoxic state or upon a correlated constitutional basis of the two conditions.

TREATMENT.

Medical and Dietetic Treatment.—I. Bram,¹⁷ carrying on his campaign in favour of the medical treatment of primary Graves' disease, maintains that the end-results of 600 cases followed up for a period of eight to twenty years show 90 per cent to be entirely well, while the remainder presented varying degrees of residual signs of little or no subjective importance.

J. Klein¹⁸ urges that more attention should be given to calcium metabolism in hyperthyroidism and claims that two patients were cured by *calcium gluconate* without any other drugs: 10 c.c. of a 10 per cent solution were injected intramuscularly twice with an interval of one day, followed by a teaspoonful of calcium gluconate every four hours.

E. Herzfeld and A. Frieder¹⁹ relate their experience with *catechin* (sometimes called *tyronoman*), a substance that Blum separated from the blood, which balances the action of the thyroid. The authors state that the treatment only failed in 2 out of 18 cases. Tablets each containing 10 units were given, first 1 three times a day, increasing up to 6 and even 9 tablets daily, and then gradually decreasing again. As a rule the treatment had to be continued for four to six weeks. During treatment the patients should abstain from meat and

all stimulants, including nicotine. Plenty of carbohydrates, fruit, vegetables, milk, and animal fats are given. It will be noted that this last indication is in direct opposition to the views of Nell,²⁰ who, in the course of a somewhat dogmatic article on exophthalmic goitre, states that the experience of the war and post-war periods demonstrated that a spare diet, poor in albumin and fat, diminished the incidence and severity of thyrotoxicosis, whereas a lacto-vegetarian diet consisting of small but frequent meals was the most effective in raising the weight and improving the general condition. This hardly accords with experience in Great Britain. N. Kletz²¹ recommends a diet very rich in carbohydrate, including honey and glucose, together with Lugol's iodine in varying dosage until the optimum point is considered to be reached. But this method was chiefly used as a preliminary to operation.

Treatment by Irradiation.—F. Bardachzi and R. Epstein,²² while holding operation to be the best treatment for exophthalmic goitre, advocate irradiation combined with careful administration of iodine in persons who fear an operation or for whom an operation would be dangerous. In the most severe cases iodine treatment should precede irradiation.

J. Belot and L. Delherm,²³ in considering the rôle of X rays in the treatment of Graves' disease, point out that although radiotherapy is in general less rapid in its results, it leaves the patient capable of carrying on his ordinary life during treatment, conserves the integrity of the skin, and involves no risk of a fatality.

S. Ginsburg²⁴ advocates radium therapy in mild or early cases, for recurrence after operation, in cases where operation is refused, or where the operative risk is considerable. He recommends operation, on the other hand, for cases refractory to radium, or where a quick result is required for economic reasons, where a large adenomatous mass is present, or where there are compression symptoms.

Hypothyroidism.—W. O. Thompson and others²⁵ found the effects of desiccated thyroid by the mouth and of thyroxin intravenously or subcutaneously were the same on the basis of equivalent iodine contents. (*See also OBESITY.*)

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1933, May, 870; ²*Jour. Amer. Med. Assoc.* 1933, July 22, 256; ³*Lancet*, 1933, ii, Nov. 11, 1081; ⁴*Jour. Amer. Med. Assoc.* 1933, Sept. 16, 901; ⁵*Proc. Roy. Soc. Med.* 1933, July, 1223; ⁶*Bull. Johns Hopkins Hosp.* 1934, Jan., 48; ⁷*Med. Jour. and Record*, 1933, Dec. 6, 411; ⁸*Presse méd.* 1933, Dec., 1942; ⁹*Med. Jour. and Record*, 1933, Oct. 4, 221; ¹⁰*Guy's Hosp. Rep.* 1934, Jan., 118; ¹¹*Lancet*, 1933, ii, Sept. 30, 742; ¹²*Jour. Nerv. and Ment. Dis.* 1932, lxxvi, Oct., 331; ¹³*Jour. Amer. Med. Assoc.* 1933, March 18, 863; ¹⁴*Amer. Jour. Med. Sci.* 1933, July, 73; ¹⁵*Jour. Amer. Med. Assoc.* 1933, Jan. 28, 296; ¹⁶*Guy's Hosp. Rep.* 1934, Jan., 25; ¹⁷*Med. Jour. and Record*, 1933, Dec. 6, 423; ¹⁸*Ibid.* 427; ¹⁹*Deut. med. Woch.* 1933, lix, Jan. 20, 84; ²⁰*Beitr. z. klin. Med.* 1933, clvii, Feb. 18, 113; ²¹*Lancet*, 1933, ii, Nov. 4, 1024; ²²*Med. Klin. Berlin*, 1932, xxviii, Sept. 23; ²³*Presse méd.* 1933, June 14, 945; ²⁴*Jour. Amer. Med. Assoc.* 1933, Feb. 25, 613; ²⁵*Arch. of Internal Med.* 1933, Oct., 576.

THYROID HEART.

A. C. Gibson, M.D., F.R.C.P.

C. Eggleston¹ gives his conclusions on the medical treatment of patients with thyrotoxic cardiac disease. He distinguishes four clinical types: (1) Graves' disease with structurally normal heart; (2) Graves' disease in patients with rheumatic heart disease; (3) Thyrotoxicosis in patients with arteriosclerotic or hypertensive heart disease; and (4) Patients with masked hyperthyroidism. He lays particular stress on the view that thyrotoxicosis is the common factor and is primarily responsible for the cardiac manifestations in all four types. This being so, successful control can only be attained by a treatment of the thyroidal condition. His plan is that each case should be discussed with a surgeon at the beginning so as to arrange for surgical intervention

at the most opportune stage, when the patient is in the best condition for it. Physical and mental rest are the first things that must be ensured. The patient should be confined to bed in quiet surroundings with bromides or other sedatives to control the nervousness. It is seldom necessary to resort to opiates, which should be reserved for the alleviation of severe dyspnea and its attendant mental distress in the first few days of treatment if such symptoms are present. In addition to bromides, chloral and the barbiturates may be used. Sleep should be procured by hypnotic doses of chloral or paraldehyde. The necessity for operation and its beneficial results should be discussed freely with the patient at the beginning of treatment and not referred to again. The patient should under no circumstances be harassed by days of anticipation by knowing the date of the operation. A basal anæsthetic should be given to the patient on the day of operation before leaving his bed.

Diet should be abundant, with a minimum of protein and carbohydrates in abundance. Glucose should be given twenty-four hours preceding the operation in orange-juice or other fruit drinks. Abundant fluids must also be taken at this stage. Attention to these points contributes largely to the prevention of acidosis and dehydration. Oedema is treated at once by one of the mercurial diuretics such as salyrgan. The anginal type is benefited by theobromine. Quinidine is best reserved for the restoration of rhythm after the operation. So long as improvement in the patient's condition is manifest, these procedures are persisted in. After that iodine should be administered for ten or fourteen days until its maximum benefit has been obtained. Eggleston gives 10 min. of Lugol's solution thrice daily, but the iodides also act well. The optimal effects of iodine tend to diminish quickly, and therefore at this period the operation should be undertaken, though whether in one or two stages must be determined. Hemithyroidectomy often diminishes the toxicosis so considerably that a very short interval of medical treatment is required between the first and second operation.

F. H. Lahey,² in speaking of the post-operative results in thyrotoxicosis, says that the adverse factors are a previously damaged heart, the presence of auricular fibrillation, and the onset of senile changes in the heart. In the pre-operative preparation of those patients on the verge of or in an actual thyroid crisis with auricular fibrillation, congestive heart failure, and severe hyperthyroidism, benefit can be obtained by a slow intravenous administration of 300 to 400 c.c. of a 20 per cent solution of glucose to which has been added 30 drops of Lugol's solution and a full dose of digitalis.

E. C. Eppinger and S. A. Levine³ give the after-treatment of patients following total thyroidectomy. Hoarseness and aphonia, the result of injury to the recurrent laryngeal nerves, were seldom serious and require no special treatment. Post-operative tetany was rare, never severe, and occurred within four to fourteen days after the operation, and was controlled by 5 to 10 drops of viosterol and 60 to 120 gr. of calcium lactate daily for a period of two to three weeks. It was never necessary to use parathyroid extract and no recurrences were noted. Mild symptoms of myxœdema occurred almost invariably, such as puffiness of the face, lassitude, dryness of the skin, pains in the joints, and gain in weight. These symptoms were easily controlled by giving thyroid, and it was found that it was best to keep the metabolic rate at a level of about minus 20. Thyroid extract given to elderly sclerotic patients with myxœdema may induce attacks of angina pectoris or precipitate congestive cardiac failure. The dose, therefore, must be small at first and cautiously increased. The authors' rule is to give $\frac{1}{2}$ gr. of the desiccated gland (Armour) daily for one week and to continue subsequently with half that dose. In patients in whom cardiac compensation could be restored previous to operation the period of

convalescence in hospital was not longer than two to three weeks. When congestive failure is present at the time of the operation the full effect does not become apparent until three or four weeks after the operation. Patients were allowed to become ambulatory when the signs and symptoms of heart failure had disappeared. Digitalis in full doses should be used to combat the decompensation. (See also HEART FAILURE, THYROIDECTOMY IN.)

REFERENCES.—¹Amer. Jour. Med. Sci. 1934, clvii, June, 737; ²Amer. Jour. Surg. 1934, xxiv, May, 225; ³Jour. Amer. Med. Assoc. 1934, cii, June 23, 2076.

THYROID AND PARATHYROID SURGERY. (See also THYROID HEART; X-RAY AND RADIUM THERAPY.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

Thyroid Deficiency.—C. H. Mayo¹ states that after a long experience he found the metabolic rate of many people on the minus side. He noted particularly the differences in the reactions of persons to similar operations: some are excitable and require special effort before operation, at operation, and after operation; others go through simply, with little reaction and with only a slight rise in temperature. On the first or second day there are patients who have a slight rise in temperature without any explanation for it; there are others who tend to have subnormal temperatures. He is not referring to cases of goitre. He has considered all kinds of surgical cases. The number of people who usually have subnormal temperatures is remarkable. Incidentally Mayo observes that patients that had pulmonary embolism had normal temperatures or subnormal temperatures, and that this condition was rarely seen in the presence of a steady or irregular fever. "Some people are used to getting along with a low metabolic rate, they are always watching the radiators in their homes and can tell if there is one degree of change in environment temperature, they are likely to wear shawls and sweaters, they can tell if someone has left a door or window open, but because they have not manifest myxœdema they are seldom sent to have a metabolic test."

Mayo stresses the fact that a patient may receive immense benefit from the discovery that his thyroid gland is deficient in functioning. The average case will only require 2 gr. of thyroid daily.

Mayo's paper is full of philosophy. *Inter alia* he says most people who have become temporarily incapacitated by infections which from time to time are thrown into the blood-stream, and which are carried in tonsils, teeth, prostate, or uterine cervix, will be found to have temperatures one or two degrees below normal between 2 and 6 a.m. It is at such time that danger comes from chronic infections. A want of normal amounts of thyroid secretion in the tissues is an especial danger to such people. There is one type of infection, however, accompanied by fever in which stimulation of the thyroid gland would be a detriment. Mayo refers to tuberculosis. Since fever tends to stimulate the thyroid gland to activity it is best to treat the patient in a climate where the fever will be minimized.

Toxic Goitre.—It is interesting to remember that in the early days of toxic goitre the operative mortality was as high as 15 per cent. Thirty years ago this was the figure given by the Mayo Clinic. It is now less than 1 per cent. According to T. A. Hindmarsh² the mortality from medical treatment varies between 10 and 30 per cent. Most authorities will agree with this writer that the cases for operation must be carefully judged, because in some cases complete and permanent cure follows efficient medical measures. In a number of cases medical measures should be at first tried. Often permanent cure will follow closely on the removal of septic foci succeeded by efficient medical care.

Hindmarsh has never seen any harm result from the administration of *iodine* (*Lugol's solution*) continuously during the entire course of the disease. He has no doubt, however, that early operation will give over 95 per cent of complete cures. The administration of iodine as a pre-operative measure is now universal. A patient who has taken iodine solution for any length of time will have a firm enlarged thyroid. The longer she is taking the iodine, the harder the gland becomes. It is a mistake, therefore, to recommend surgical measures in the absence of a normally sized soft thyroid gland. In the cases which show tendency to recovery X-ray treatment will often expedite the cure, but in bad cases X rays will not cure the condition.

Hindmarsh mentions that *prolonged X-ray applications* cause fibrosis and adhesions which make operation difficult and dangerous. [This is not the experience of the reviewer; in many cases he expected to find fibrosis and adhesions, but apparently such changes were not produced even after prolonged X-ray therapy.]

Choice of Anaesthetic.—All will agree with Hindmarsh in his statement that to give a patient with hyperthyroidism chloroform is almost tantamount to murder. He advocates the use of avertin and a small amount of open-ether. The administration of a free supply of oxygen during and after operation for hyperthyroidism is of prime importance; with an increased metabolic rate the tissues are crying out for oxygen. The free administration of glucose before and after operation is essential. There must be plenty of material to be burnt up at the metabolic crisis.

[With regard to the question of anaesthesia, the reviewer still believes that the safest and best method is *colonic-ether*, given by modern methods. The administration is preceded by a hypodermic of morphia. During the operation the tissues are infiltrated with a local anaesthetic. The one drawback is the length of time which it takes to induce anaesthesia by *colonic-ether*. Time-saving, however, should not be a paramount consideration in this or any other branch of surgery.—W. I. de C. W.]

Preliminary Ligation in Graves' Disease.—There is considerable difference of opinion with regard to preliminary ligation as a first step towards thyroidectomy in severe cases of toxic goitre. The reviewer's views were expressed as follows in a letter to the *British Medical Journal* (1934, Sept. 21).—

"About twelve years ago the pre-operative treatment of Graves' disease was placed upon a firm scientific basis. Since that time the indications for preliminary arterial ligation are few and far between.

"It is true, but not universally true, that the patients who derive greatest benefit from ligation belong to precisely the same group as those who respond readily to the administration of iodine. Conversely, if iodine fails it is reasonable to assume that ligation will prove a disappointment. Dogmatism is, however, to be avoided in this as in most other surgical considerations.

"After a long experience in an area in which Graves' disease was not uncommon, I have been guided by certain beliefs:—

"1. In the case of the really bad surgical risk in which adequate and prolonged pre-operative preparation is of no avail, ligation is indicated. The second or third shot sometimes hits the target and the prognosis may become completely changed. Thus ligations, although rarely indicated, may convert a bad surgical risk into a case safe for thyroidectomy when other weapons have failed.

"2. A severe reaction sometimes follows ligation or any other procedure. Such a reaction indicates the intolerant condition of the patient, and is a warning to proceed with caution by carefully graded operative measures.

"3. In the event of a fatal result following ligation in the serious type of case under review surgery is blameless.

"4. It is important to ligate the trunk of the superior thyroid artery after clear exposure. The anterior branch is sometimes mistaken for the main vessel. Additional ligation of both anterior and posterior branches inhibits the collateral circulation from below. Personally I avoid thyroidectomy in a case of uncontrolled hyperthyroidism without a preliminary attempt to obtain control by ligations. We must recognize, however, that the personal factor is of importance.

"Each surgeon will obtain the best results by following the path with which he is most familiar, but familiarity with thyroidectomy does not necessarily imply familiarity with the ligation of the isolated thyroid trunk. I have seen Kocher, Mayo, Crile, and many others at home and abroad, including some of your correspondents, operate on cases of severe hyperthyroidism. As a spectator one instinctively felt that if each had operated in precisely the same manner the brilliancy of the results would have been adversely affected.

"Preliminary ligation of the inferior vessels, sometimes recommended as a step towards thyroidectomy, is attended by too much disturbance to justify it as a routine. Here again personal factors must be weighed. Some surgeons have perfected their methods of approach and regard ligation of the inferior thyroid artery as a valuable addition to the patient's defence. Finally, may I suggest the retention of the term 'Graves' disease' in general discussions on this subject? Knowledge is incomplete until the works of the great Dublin physician are studied and digested."

Many debatable questions in connection with Graves' disease are reviewed by L. M. Zimmerman.³ In the absence of the cardinal signs of exophthalmic goitre this writer draws attention to the secondary symptoms such as tachycardia, loss of weight, and persistent elevation of basal metabolism. Response to Lugol's solution confirms the diagnosis. There are many atypical cases. Diseases of the central nervous system may simulate hyperthyroidism. In children the clinical manifestations are essentially the same as those in adults. The treatment follows the same general principle. Surgery is the treatment of choice, and the end-results are good.

Prevention of Complications in Thyroid Surgery.—This subject is discussed by A. S. Jackson.⁴ The complications mentioned cover the whole field, from injury of the recurrent laryngeal nerve, air embolism, and tetany to such remote conditions as mania and infection.

Complete Thyroidectomy in Cases of Congestive Heart Failure and Angina Pectoris.—This subject has created much speculative interest. The conception of removing the normal thyroid gland completely in cases of heart disease arises from the fact that the higher the metabolic rate the greater the demands on the heart. Conversely, in cases of myxœdema when the metabolism is depressed the velocity of the blood-flow is reduced to one half of normal. This important relationship between the demands of tissue metabolism and the supply of blood by the normal heart formed a theoretical basis for believing that in cases of chronic heart disease and normal metabolic rate the production of artificial myxœdema might result in a striking clinical improvement. These matters are dealt with by D. D. Berlin.⁵ The hearts of such persons, he says, might be unable to supply sufficient blood for the ordinary demands of a normal metabolic rate, but might, nevertheless, be able to supply enough blood for the lessened needs of a reduced metabolic rate. Two patients suffering from congestive heart failure were operated on in 1932. Nine-tenths of the gland was removed. Both patients made excellent recoveries

and showed striking clinical improvement. There was, however, retrogression following the rise in the metabolic rate five weeks after operation. It was concluded, therefore, that for success the entire gland must be removed.

Berlin performed the first operation of total thyroidectomy in 1932. The patient is now restored to occupational usefulness after three years of complete cardiac invalidism. Surgery in these chronic heart cases is tolerated reasonably well. The major steps of the operation may be summarized as follows: A low Kocher collar incision is made. The flap is reflected upwards as high as the superior border of the thyroid cartilage. The lower flap is not disturbed. The anterior jugular veins are ligated before proceeding with the division of the ribbon muscles. Division of these muscles gives better exposure than retraction and is strongly recommended. The lateral lobe of the thyroid is dislodged and divested of its outer fascial envelope. The gland is further mobilized by ligating the lateral thyroid vein. The superior thyroid artery is ligated when the upper pole is detached. The isthmus is liberated by passing a forceps between it and the trachea. The tracheo-oesophageal sulcus is cautiously invaded to identify and isolate the parathyroid glandules. They are yellowish-brown, flattened oval bodies about the size of a split pea. They have a granular surface which assists in distinguishing them from neighbouring lobules of fat. They are usually found in relation to the terminal branches of the inferior thyroid artery. While four is given as the usual number, it may be difficult to demonstrate the presence of more than two or even one parathyroid. Only the terminal branches of the inferior thyroid artery are ligated, in order to conserve the circulation of the parathyroids. It is stated that the recurrent laryngeal nerve is more often anterior to the inferior thyroid artery on the right side than on the left. The resection is repeated on the opposite side, and the gland, if possible, removed in continuity. A careful search of the entire gland is made for adherent or embedded parathyroids, which, if found, are re-implanted in the sternomastoid muscle. The operation must be complete, no thyroid tissue being left behind.

(See also HEART FAILURE, THYROIDECTOMY IN.)

Total and Subtotal Thyroidectomies.—J. C. Moore⁶ discusses these operations, and says that at least 2 per cent of all goitres are malignant. In cases of acute thyroiditis the chief complaint is pressure. Operation is performed to free the trachea from constriction. Excision of a wedge-shaped piece of thyroid, completely dividing the isthmus, allows the lateral portions to retract into the muscles of the neck.

Malignant Disease of the Thyroid Gland.—L. W. Smith, E. H. Pool, and C. T. Oleott⁷ report a study of 42 cases of thyroid malignancy treated at the New York Hospital in the past thirteen years, during which period there were approximately 100,000 admissions and 855 thyroid specimens were examined. They studied also 12 specimens of thyroid malignancy from other sources. The ages of the patients ranged from 22 to 69 years and averaged 48·8 years; 41 of the 54 patients were women. The previous existence of an adenoma was recognized as the essential factor in the development of the malignancy in 92·6 per cent of the cases. The tumours were of the following types: papillary adenocarcinoma, foetal adenocarcinoma, epidermoid carcinoma, giant-cell carcinoma, small round-cell carcinoma, and sarcoma. Each type is discussed in detail and shown by photomicrographs. A correct diagnosis is made before operation in only a small percentage of the cases as there are no clinical symptoms suggesting the nature of the tumour. The prognosis is definitely unfavourable. In the authors' opinion irradiation is the treatment of choice. Surgery is of little avail after the tumour has invaded the capsule of the adenoma or the parenchyma,

R. S. Dinsmore and N. F. Hicken⁸ deal with metastases of malignant tumours of the thyroid. They summarize an interesting paper in the following way:—

1. In a study of 124 cases of metastatic lesions from a primary thyroid malignancy as observed at the Cleveland Clinic, malignant thyroid tumours are classified as: lymphosarcoma, spindle-cell sarcoma, carcinoma-sarcoma, adenocarcinoma not arising in an adenoma, papillary carcinoma, and malignant adenoma.

2. The so-called 'benign metastasizing adenomas' are malignant lesions; this term is misleading and should be abandoned.

3. The lungs are the most frequent site for metastasizing thyroid tumours. Thirty-six cases were observed; in 75 per cent of the cases the lesions were bilateral, and in 97 per cent there were multiple nodules present.

4. An analysis was made of 18 cases of skeletal metastases from thyroid neoplasm with a discussion of location, symptoms, type of tumour, and prognosis.

5. In 264 primary thyroid malignancies the cervical lymph nodes were involved in 35 per cent of the cases. The anterior cervical glands are usually the first to be invaded.

6. Secondary thyroid lesions in the heart, kidney, liver, eyes, and muscles are discussed with a review of reported cases.

7. Active treatment such as thyroidectomy, lobectomies, biopsies, decompressions, and tracheotomies, supplemented by irradiation therapy, particularly in radiosensitive tumours, not only makes the patient more comfortable but may increase the span of life in certain cases.

M. B. Tinker⁹ speaks of permanent cure of cancer of the thyroid. The best results have been obtained from combined irradiation and surgery. It is not true to say that if the diagnosis of malignancy can be made with reasonable certainty before operation, the outlook is almost hopeless. Radical excision was the only treatment in the early days of thyroid surgery. Electric surgery should be used in dealing with all malignancies. According to Tinker, radio-cutting destroys cancer cells and seals the vessels of the lymphatics. This should be followed by irradiation even in apparently hopeless cases. These give a highly encouraging number of cures, which will doubtless increase with further experience.

Acute Thyroiditis.—R. C. Cochrane and S. J. G. Nowak¹⁰ state that of all the conditions for which this disease is mistaken cellulitis of the neck is most frequent. The latter is extremely rare in the lower half of the neck in the mid-line. It is found practically always in its greatest intensity in the submaxillary or carotid triangles. It is quite safe to say that cellulitis of the lower half of the front of the neck is secondary to an inflamed thyroid gland.

Irradiation of the Parathyroids for Adenoma.—Max Cutler and S. E. Owen¹¹ summarize a detailed paper as follows:—

1. A case of generalized osteitis fibrosis cystica associated with hypercalcaemia is reported in which marked clinical improvement took place following treatment by radiation of the parathyroid glands.

2. This observation and others recorded in the literature suggest the use of this method in cases in which surgical operation is contra-indicated or in which parathyroidectomy fails to produce a cure.

3. Radiation of each parathyroid area separately is suggested as a possible aid in determining the site of the adenoma before operation, a procedure which may render the exploration technically less difficult. Further observations along this line are needed.

4. The relative merits of surgery and radiation as the essential treatment of parathyroid adenoma associated with generalized osteitis fibrosis cystica must await further observations.

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TONSILS, AFFECTIONS OF.

F. W. Watkyn-Thomas, F.R.C.S.

During the past year there has been some discussion as to the necessity for the large number of operations for tonsillectomy at present performed. A debate "That operations for the removal of tonsils are too often performed without adequate cause" led to some interesting comments.¹

H. Tilley raised two points for inquiry: (1) What are the functions of the tonsils? They probably provide a continuous supply of phagocytes, and when they are removed there may be a compensatory hypertrophy of lymphoid tissue from the base of the tongue which grows up into the empty tonsillar fossa and makes it appear that the tonsil was not properly removed at the operation. Unfortunately these new deposits may cause dryness and soreness of the throat. (2) What constitutes a septic tonsil? Tilley pointed out that the presence of yellowish-white debris in the crypts is certainly not evidence of sepsis. The size of a tonsil is no criterion of the nature or degree of sepsis within it. A septic tonsil is one in which "the natural protective barriers have broken down so that pus-producing and pathogenic organisms with their toxins have entered the lymphoid follicles and thus found their way by the lymphatics of the tonsils into the general circulation. As a result of this invasion of the tonsil we may expect to find various signs and degrees of inflammation in the tonsils coupled with a history of recurrent attacks of acute tonsillitis and/or distal symptoms suggesting a mild general toxæmia which is often associated with one or more local manifestations, e.g., myositis, neuritis, types of infective arthritis, symptoms suggestive of cardiac infection, certain skin lesions, and an increasing number of other affections, of which the latest and perhaps the most striking are some mental diseases, to which William Hunter has applied the term 'septic psychoses'.

"The most certain proof of a chronic tonsillitis is always the recurrence of acute attacks." But if this proof is lacking and there is evidence of focal sepsis, Tilley held that the tonsils may be condemned if: (1) Liquid pus can be expelled from the crypts by pressure; (2) There is an enlarged tonsillar lymph-gland behind the angle of the jaw, varying in size and sometimes painful on pressure; (3) A purplish-red tinge limited to the anterior pillar; (4) An abnormal preponderance of leucocytes in material taken from the tonsillar crypts.

There are conditions which cause enlargement or inflammation of the tonsils, and if these conditions are treated there will often be no need for tonsillectomy. Such conditions are: (1) A deficiency disease, such as rickets, or a diet with excess of fat and carbohydrate but deficient in vitamin A. (2) There is no need to remove slightly enlarged tonsils when the symptoms are typical of adenoid obstruction—removal of the adenoids will often be enough. (3) Dental sepsis is a frequent cause of tonsillar congestion. (4) Many enlarged tonsils, often accompanied by adenoids, are the result of infections of the nasal sinuses, and particularly of the antrum. In such cases if the nasal sepsis is cured, no operation on the nasopharynx will be needed. At the same time we must remember that sinus infection may itself be caused by tonsillar sepsis and

adenoids, and that, after removal of the tonsils and adenoids, the nasal discharge ceases. The speaker laid emphasis on the fact that tonsillar enlargement occurring in boys at puberty and associated often with lassitude is a physiological, not a pathological, condition.

J. A. Glover, from a study of statistics, made the following deductions:—

1. There has been an immense and rapid increase in the numbers of tonsillectomies annually performed.

2. More than half the most carefully nurtured children in this country are now subjected to tonsillectomy, whereas forty years ago none of their parents underwent the operation.

3. Whilst the incidence of tonsillitis is at least as high amongst the poor as amongst the well-to-do, the children of the latter have an incidence of tonsillectomy at least four times as high.

4. With the single exception of diphtheria, the incidence of the ordinary infectious diseases is unaffected by tonsillectomy; while the incidence of recurrent sore throats is perhaps somewhat diminished, that of frequent colds is unaltered, or perhaps slightly increased.

5. The incidence of otitis and mastoid disease is the same, or perhaps slightly increased in the tonsillectomized, while their liability to bronchitis and pneumonia is also probably slightly increased.

6. The evidence with regard to the effect of tonsillectomy on acute rheumatism, chorea, and carditis is conflicting, but there is no sufficient case for the routine removal of apparently healthy tonsils in a rheumatic or potentially rheumatic child, simply as a measure of prophylaxis against acute rheumatism. Removal should only be undertaken if there is some specific indication.

7. Whilst there is no reason to doubt the high value of the operation in cases in which there is sure evidence of toxic or obstructive damage, there is in the facts enumerated clear evidence that the operation is too often performed without adequate cause, without sufficient regard to the possibilities of purely temporary physiological and immunological enlargement, and to the tendency to spontaneous involution. As a prophylactic ritual the operation is useless, and a large proportion of tonsillectomies now done in children appears to be unnecessary, to involve some risk, and to give little or no return.

Dan McKenzie remarked that as a justification for 'mass operating' we can point to a mass disease. Under the tonsil-adenoid symptom complexes we must include frequent coryzas, deafness, middle-ear suppuration and all its complications, rhinitis and nasal sinusitis, epistaxis, tonsillitis and the rheumatisms, croup, bronchitis, mal-development of the skeleton, mental dullness; also such "less obvious effects" as osteomyelitis of the long bones, endocarditis and valvular disease of the heart, and certain forms of nephritis. These conditions are not always due to tonsils and adenoids, but if any of them occurs in a child with enlarged tonsils or adenoids our first duty is to deal with the probable cause—the tonsils and adenoids. Further, McKenzie criticized the statistics on the ground that there was no evidence that the tonsils had been properly removed at operation. In fact, in one group of Glover's figures it was noted that 5 per cent of tonsillectomized children had tonsillitis after operation.

Archer Ryland, while admitting that even up to ten years ago the operation might have been performed too often, did not believe that the statement was true to-day. Against statistics he urged the general experience of years as to the value of the operation.

Lord Dawson agreed that there could be no question that tonsils should be removed if enlarged and mechanically obstructing, or if demonstrably diseased and infected. The difficulty was in cases of focal infection where the local

condition of the tonsil alone would not lead one to advise tonsillectomy. The tonsils and the teeth are so easily investigated, in comparison with the gall-bladder or the appendix, that in the search for a focus of sepsis we are apt to judge them too critically. Also, there are difficulties inherent in the operation however skilfully it is done, and some fibrosis may follow with limitation of the palatal movement and consequent post-nasal catarrh, with bronchial catarrh as a late sequel—"not an argument against operation, but an argument for great discrimination in doing it." Lastly, there is the danger of overlooking a causal nasal sinusitis.

T. B. Layton said that there was no operation in surgery "which, in comparison with its magnitude, is fraught with so many disastrous complications and dangers, many of which are lethal." He felt that the term "enlarged tonsil" should not be used.

Leonard Findlay pointed out that if Glover's statistics were accepted, the removal of the tonsil not only had no curative action, but indeed made the child more susceptible to the greatest variety of diseases. In Glasgow it had been found that severe otitis media was diminishing in frequency, and this change was coincident with the more frequent removal of tonsils. From the point of view of prophylaxis of otitis media, cervical adenitis, and rheumatic carditis, in any case in which there was doubt regarding disease of the tonsil he would recommend its removal.

J. D. Kershaw produced figures showing great improvement in cases of otitis media and recurrent colds. He pointed out a possible fallacy in statistics for rheumatism: rheumatic symptoms usually occur about the eighth year, and many tonsillectomies are performed before that age.

The general conclusion from this discussion seems to be that the removal of tonsils and adenoids is a most valuable procedure when the tonsils or adenoids are causing trouble; but that we must never forget that the tonsillar inflammation may be the effect of trouble elsewhere rather than the cause, that a large tonsil is not necessarily doing any harm, and that unless they actually obstruct the airway, removal of uninfected tonsils cannot do any good.

REFERENCE.—*Post-Graduate Med. Jour.* 1934, Jan., 6.

TRACHOMA. (See CONJUNCTIVA, DISEASES OF.)

TRICHINOSIS.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—The prevalence of trichinosis in the United States has recently been emphasized by several writers. According to W. A. Riley and C. H. Scheffley¹ a large number of serious cases are seen by the medical practitioner or pathologist, and the condition is frequently mistaken for typhoid fever, rheumatism, or malaria. Twenty persons who had shown no symptoms of the disease during life were found on post-mortem examination by the writers to have trichinosis.

M. D. Kenler and J. J. Silverman² state that 237 cases and 15 deaths were reported in the United States during the first eleven months of 1932. This return, however, is not complete, as trichinosis is not notifiable in many States. In New York City 60 cases were notified in 1930, 90 in 1931, and 71 in 1932.

SYMPTOMS AND COMPLICATIONS.—The *skin changes* in trichinosis are discussed by A. Musger,³ who states that they may be of a very varied character, such as urticaria, morbilliform and scarlatiniform rashes, or resemble the eruptions of syphilis, typhoid, or typhus. The third week is the usual time for their appearance shortly before the temperature has reached its height, and their duration is from one to three weeks. During the febrile period miliaria,

herpes, small hæmorrhages, and pruritus may occur. Alopecia may develop in convalescence.

R. A. Kilduffe, S. Barbash, and A. G. Merendino⁴ report a case of trichinosis complicated by *femoral thrombosis* in a man, aged 42, who on the tenth day of disease developed severe pain in the upper part of the left thigh in which gangrene set in. Amputation was performed, and death ensued two days later, being due to toxic absorption from the gangrenous leg and the shock of the operation.

E. R. Pund and R. Mostelle⁵ record a fatal case of trichinosis in a negro boy, aged 11, who developed *encephalitis*. There was no diarrhoea and no eosinophilia, but examination of the blood showed sickle-cell anæmia. Minute inflammatory foci, in many of which embryos of *Trichina spiralis* was present, were found in sections of the cortex, basal ganglia, medulla, and cerebellum.

DIAGNOSIS.—R. A. Kilduffe⁶ tried the *Bachman intradermo reaction* in 33 cases of human trichinosis; this is performed by injection of a 1 per cent solution of powdered trichinellæ, and ranges from a slight area of oedema to a well-defined hæmorrhagic area appearing within a week of infection. Kilduffe's conclusions are as follows: (1) The demonstration of eosinophilia is not only technically simpler than the demonstration of the skin test, but is always feasible, whereas the skin test is not; (2) In point of delicacy and constancy of appearance eosinophilia is a reliable index of trichinosis in the human subject; (3) The Bachman skin test presents no practical advantage over the demonstration of eosinophilia in the study of human trichinosis.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1934, cii, 1217; ²*N. Y. State Jour. Med.* 1933, xxxiii, 752; ³*Dermatol. Zeits.* 1933, lxxviii, 34; ⁴*Amer. Jour. Med. Sci.* 1933, clxxxvi, 794; ⁵*Jour. Amer. Med. Assoc.* 1934, cii, 1220; ⁶*Amer. Jour. Med. Sci.* 1933, clxxxvi, 802.

TROPICAL ULCER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The relation of diet to tropical ulcer is reported on by F. W. Clements,¹ who found it to be the greatest cause of morbidity among the natives of New Guinea and Papua. In the Island of Manus it was found that fish-eaters of the south coast area suffered little from the disease, but it was common among the agriculturists of the mainland living chiefly on the food they grew, especially sac-sac obtained from the sago palm, among whom the incidence was 4.12 per cent, against one of 2.5 per cent in the fish-eating south coast people. The sac-sac was found to contain no measurable amount of vitamins and very little protein and fat, but 83.5 per cent of carbohydrates, and it is suggested that these deficiencies in the diet make the skin epithelium more suitable for the growth of invading bacteria. S. Golovine² deals with the treatment of tropical or phagedenic ulcers of warm climates, and advises cleansing the ulcers by removing the necrosed tissues, regular washing with tepid weak permanganate of potassium solutions, and, after drying, powdering with a mixture of 100 parts each of iodoform and boric acid with 20 parts of subnitrate of bismuth, and protecting by gauze bandages and daily dressings against reinfection.

REFERENCES.—¹*Med. Jour. Australia*, 1934, April 21, 520; ²*Presse méd.* 1933, Dec. 27, 2102.

TRYPANOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Further studies of H. L. Duke¹ on the *transmission of polymorphic trypanosomes by tsetse flies* deal with the following points. Kleine's original work showing that tsetse flies do not become infective until the trypanosomes developing in their guts reach the salivary glands has been generally confirmed, and the evidence points to the maintenance of infectivity as long as the fly lives. An infected fly has, however, been met with showing the salivary

glands infected, but no flagellates remaining in the gut. The effects of temperature on the development of trypanosomes in the tsetse flies is considered in light of the literature, and especially of Taylor's work in West Africa, and Entebbe experience, and exposure of the insects to a temperature of 95° to 98° F. during the period of feeding was found to raise the infection rate of the flies, mainly owing to its effect on the fly's tissues. The duration of the biological cycle in *Glossina* is next dealt with, and it is concluded that man's trypanosomes usually develop completely in twenty-five days or less, and only very exceptionally require more than thirty days. A comparison of the power of *T. rhodesiense* and *T. gambiense* respectively to develop cyclically in *Glossina* has been examined in the light of the extensive Entebbe experience, and it was found that the former is more readily transmitted by *G. palpalis*. Lastly, the effect of cyclical passage through *Glossina* is discussed in relation to changes thus induced in the parasite, and it is reported that a single passage through *G. morsitans* of a strain of *T. brucei*, which had been transmitted by direct inoculation through vertebrates for five years, had no apparent effect on its power to develop in *Glossina*. Further repeated cyclical passages of *T. brucei*, *T. gambiense*, and *T. rhodesiense* through *G. palpalis* did not enhance their infectivity or transmissibility to this fly, but rather tended to reduce their power to develop in the tsetse fly. The author remarks that on the solution of these conundrums may depend to a great extent the future of large tracts of Africa.

An important study of *Nigerian polymorphic trypanosomes* is reported by H. M. O. Lester,² as they include those from mild and virulent epidemic cases of sleeping sickness in that area as well as laboratory strains. Posterior nuclear forms were found in all, and there was great variation in their susceptibility to trypanocide, and no diminution of the trypanocidal properties of the blood of the patients was found. The author also confirmed the observations of Kleine, Duke, and others regarding the negative results of the inoculation of a number of human volunteers with *T. brucei*, and he came to the same conclusion as Kleine—namely, that *T. gambiense* and *T. rhodesiense* are mild and virulent varieties of one human trypanosome, and that the latter is not a human infection with the *T. brucei* of animals, as still held by some. J. M. Wallace³ reports on the reactions in animals of polymorphic trypanosomes of animals on Damba Island, Victoria Nyanza, where sleeping sickness was epidemic thirty years ago, and he finds they present some variation in their present-day characters from typical *T. brucei* in the direction of *T. gambiense*, and he considers this supports Duke's hypothesis that sojourn in antelopes may modify *T. gambiense* in the direction of *T. brucei*.

The trypanocidal action of human serum has been investigated by J. T. Culbertson⁴ in the case of rats infected with *T. lewisi*; the course of this infection was found not to be affected by the injection of human serum, which did affect the course of *T. equiperdum* infection of rats. He concludes that this affords additional evidence that man's immunity to the species of trypanosomes which naturally infect animals is based on factors other than the trypanocidal activity of human serum. J. F. Corson⁵ reports that a strain of *T. rhodesiense* after cyclic passage through *G. morsitans* was not more resistant to the action of normal human serum, as tested *in vivo*, than after a series of mechanical passages.

CLINICAL.—The prognosis of Rhodesian sleeping sickness based on estimations of the total proteins in the cerebrospinal fluid is dealt with by H. Fairburn,⁶ who found this test of far greater value than the cell changes or the colloidal gold reaction. In patients infected with the *T. rhodesiense* those treated in one month or less after the commencement of the disease show 73 to 85 per cent of cures under Bayer 205 alone, and it is not clear why the rest of these

early cases are not also cured by this drug. His observations show that if at the beginning of treatment the protein is 0.03 per cent or under, the prognosis is good and the patient can be cured, usually with Bayer 205. On the other hand, if the protein is between 0.03 and 0.05, and probably even as low as 0.035 per cent, the prognosis is bad even with combined Bayer 205 and tryparsamide treatment; but in cases between 0.03 and 0.035 per cent the combined treatment may be effective, and if the protein becomes reduced the prognosis is favourable.

TREATMENT.—F. Hawking⁷ has found that normal trypanosomes suspended in a solution of acriflavine absorb practically the whole of the drug from the medium, but atoxyl-resistant strains remove only very small amounts. M. Ellis,⁸ in N. Nigeria, found thirteen injections of tryparsamide in 2-grm. doses, following one of 1 grm. at five-day intervals, effective in adults, as only 1.81 per cent were resistant, and the drug rapidly cleared the glands of trypanosomes.

REFERENCES.—¹*Ann. Trop. Med. and Parasitol.* 1933, Oct., 427, 431, 451, Dec., 569, and 1934, March, 79; ²*Ibid.* Oct., 361; ³*Ibid.* Dec., 553; ⁴*Ibid.* 1934, March, 93; ⁵*Jour. Trop. Med. and Hyg.* 1933, Dec. 1, 365; ⁶*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, March 12, 471; ⁷*Ann. Trop. Med. and Parasitol.* 1934, March, 67; ⁸*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, Aug. 4, 207.

TUBERCULOSIS OF THE LARYNX. (*See LARYNX, AFFECTIONS OF.*)

TUBERCULOSIS, PULMONARY. (*See also DIABETES MELLITUS—COMPLICATIONS.*)

L. S. T. Burrell, M.D., F.R.C.P.

Artificial Pneumothorax.—J. B. Hawes and M. J. Stone¹ advocate the more extended use of artificial pneumothorax treatment at home. They point out that it necessitates regular visits from the physician, the patient has to keep under medical supervision, and any fresh development in the disease can be detected early. It enables the patient to return to work sooner and with less risk than if the lung were not collapsed, and it often renders the sputum free from tubercle bacilli so that the patient is no longer a danger to others.

Results.—In a series of cases of pulmonary tuberculosis treated by the author by artificial pneumothorax between 1918 and 1925, the results in 1934 were as follows:—

GROUPS*	CASES	ARRESTED IN 1934	DEAD IN 1934
Group 1 ..	132	71 (53.7%)	56 (42.45%)
Group 2 ..	122	20 (16.4%)	84 (68.85%)
Group 3 ..	45	2 (4.4%)	42 (93.30%)

*Group 1 includes only unilateral cases, Group 2 those with slight disease in the better lung, and Group 3 those with a third or more of the better lung affected.

Those who are alive but unable to work or lead a normal life are not included in the table.

C. Shaw² compares the results in 267 cases treated by pneumothorax between 1922 and 1930 with 1707 treated at Midhurst in 1907–16 and recorded by N. D. Bardswell and J. H. R. Thompson in 1919.³ The results were:—

	CASES		DEAD		PERCENTAGE DEAD	
	M.	F.	M.	F.	M.	F.
Shaw's cases ..	139	128	30	31	21.5	24.2
Midhurst cases ..	1053	654	478	273	45.3	41.7

R. R. Trail⁴ followed the after-histories of 80 patients on whom he had successfully induced an artificial pneumothorax between 1924 and 1930, and of 33 control cases on whom attempts to induce pneumothorax had failed. In November, 1933 (three to nine years after the pneumothorax had been induced or attempted), of the 80 successful cases, 51 (63·7 per cent) had no sputum or were tubercle negative and were fit for work, and 16 (20 per cent) were dead. Of the 33 unsuccessful cases, 6 (18·2 per cent) are fit for work, and 22 (66·6 per cent) are dead.

Dangers.—F. R. G. Heaf⁵ is of opinion that the dangers of artificial pneumothorax should not be dismissed lightly. Each case is a potential tuberculous empyema, and an obliterative fibrosis is not uncommon and may render the lung bronchiectatic or open up cavities.

Nathan Blumberg⁶ describes three cases as indicative of the dangers of artificial pneumothorax. In the first the patient felt faint at an attempt at induction of artificial pneumothorax as soon as the needle went into the pleura which had been anæsthetized. She sat up for about fifteen or twenty seconds and then fell back dead. In the second case the patient died a few minutes after the initial pneumothorax had been induced; 250 c.c. of gas had been introduced and the pressure was slightly positive. A gas embolism was a probable cause of the disaster. In the third case, during the first refill after receiving 250 c.c. of gas the patient suddenly collapsed, and although she responded to stimulants and recovered, a left hemiplegia developed, but this too cleared up subsequently.

The author recently saw a patient who had been having pneumothorax treatment for over four years. She had a refill one afternoon and felt no ill effects and was able to go to a theatre. That night, however, pain in the side developed and was followed by severe vomiting and shock. The next day the pain and vomiting were relieved, but she complained of dimness of vision and tingling in the limbs. She became more and more collapsed and died some thirty-six hours after the refill. Post-mortem examination showed that some adherent pleura had torn below the pneumothorax cavity and there was about a pint of blood between the visceral and parietal pleura. In this case it seemed probable that the pain was due to separation of the pleural adhesions by the bleeding, and death due to gas embolism from a slight tear in the lung, although there had been no hæmoptysis.

Amongst the rare complications is pneumoperitoneum, two cases of which are described by A. L. Banyai.⁷ A slight degree of surgical emphysema is common during treatment by artificial pneumothorax, but even the severe cases usually resolve.

P. Bourgeois⁸ describes the very severe type where death may occur from asphyxia but which is sometimes relieved by incision to let the air out from the subcutaneous tissues.

Cavities.—The presence of a cavity is regarded by some authorities as an urgent indication for treatment to obtain its closure. H. L. Barnes and L. R. P. Barnes⁹ followed up 1454 cases of cavity and found a mortality of 80 per cent within one year, and other investigators have regarded a cavity as the death sentence for the patient, and therefore believe that at all costs steps should be taken to close one when diagnosed. Modern developments in radiology, however, have shown that cavitation in the moderately advanced or even in the early cases is much more common than was formerly supposed, and also that these cavities frequently heal spontaneously.

There are various types of cavity, and it is misleading to group them together and consider the mortality of the whole group. Death may occur from the acute or advanced disease which produced cavitation rather than from the

cavity itself. In cases of acute caseating tuberculosis of lung artificial pneumothorax is urgently needed in order to check the spread of disease, and if cavities have already formed when the patient is seen, pneumothorax is still more urgently needed, but it is wrong to wait for the development of a cavity before collapsing the lung in these cases. A dry cavity in a patient with no sputum, toxæmia, or symptoms is often best left alone, and the prognosis is good. Sometimes X rays show a shadow which used to be known as a pleural ring or annular shadow but is now regarded as evidence of a cavity, and there may be no other sign or symptom of cavitation. In such a case the prognosis is often good, and drastic treatment is not indicated. If in the progress of fibro-caseous tuberculosis cavitation occurs and the patient has sputum containing tubercle bacilli, bouts of pyrexia, hæmoptysis, or other symptoms associated with cavitation, the prognosis is bad and some form of collapse therapy is indicated.

B. T. McMahon and E. H. Kerper¹⁰ studied 296 patients with pulmonary cavities at Loomis Sanatorium; of these, 115 (39 per cent) had the disease arrested, 65 by spontaneous closure of the cavity after simple treatment by rest, and 50 by closure following collapse therapy. They found that the average length of time for spontaneous closure of a cavity was 5.6 months, and closure of a cavity by pneumothorax is said to take exactly the same time.

Whilst admitting that the presence of a cavity is a serious complication they think that its dangers have been exaggerated, and advocate a preliminary period of simple medical treatment and observation unless there are special indications for immediate collapse therapy. In their series the disease spread in 24 per cent of the whole group, which included many hopeless cases, and in 25 per cent of those treated by early collapse, so that the danger of spread is not eliminated by artificial pneumothorax. Spread of disease is especially liable to occur in the febrile cases, and if the patient is apyrexial and in good condition, the danger of spread is not great.

They found that the chance of spontaneous healing became progressively less as the size of the cavity increased. Closure occurred in 40 per cent when the cavity was 2×2 cm., 20 per cent if it was 3×3 cm., and 6 per cent if over 4×4 cm. Healing was less likely to occur in thick- than in thin-walled cavities and in peripheral than in central ones. They also noted in age groups 15-25 and over 45 that the chances of healing were much below the average. Right-sided cavities had twice the percentage of spontaneous closure of left-sided and three times that of bilateral cavities.

Of this series of 296 cases, 234 had a preliminary period of rest in bed and observation, and 62 were treated by early collapse of lung. Of the 234 cases, spontaneous healing of the cavity occurred in 65, or 27.7 per cent. In 83 of the remaining 169 cases collapse therapy was subsequently started and closure of the cavity obtained in 23 cases: in 12 by artificial pneumothorax, in 9 by phrenicectomy, and in 2 by thoracoplasty.

Of the 62 who received early collapse therapy, artificial pneumothorax was given in 54 and phrenicectomy in 8. Closure of the cavity occurred in 20 of the pneumothorax and 3 of the phrenicectomy cases. In 3 cases closure was obtained by thoracoplasty and in 1 by phrenicectomy after artificial pneumothorax.

Thus of 234 cases treated with preliminary observation, closure of the cavity was finally obtained in 88, or 37.6 per cent. Of the 62 treated by immediate collapse, closure of the cavity was obtained in 27, or 43.5 per cent. Of the 83 treated by collapse after a preliminary period of observation, closure was obtained in 23, or 27.7 per cent. The authors point out that the higher percentage of cures in the early collapse group is partly explained by the fact that

in 52 per cent of cases in the observation group there was a cavity in the better lung, whereas this was the case in only 7 per cent of the other group.

Paralysis of the Phrenic Nerve.—This is a surgical procedure, but may be mentioned here because it is often used merely to rest the lung, and some authorities think that it should be performed in early and slight cases and that pneumothorax should be induced later only if a phrenic operation fails. The nerve may be crushed in order to produce a temporary paralysis of the diaphragm. J. Alexander¹¹ advocates the temporary rather than the permanent paralysis of the phrenic nerve in certain cases. If there is extensive disease in one lung or much fibrosis after long treatment by artificial pneumothorax, permanent paralysis is required. But if there is some doubt as to future treatment, especially in bilateral cases, a temporary paralysis is better, and if necessary it can be converted into a permanent one at a later operation. Temporary paralysis is produced by crushing the main nerve and resecting the accessory branches for some 2 cm.

J. Morin¹² found that out of 321 cases treated with pneumothorax and 174 with paralysis of the phrenic nerve, the results were :—

	PNEUMOTHORAX	PHRENIC EVULSION
Better	50 per cent	58 per cent
Stationary	27 „	32 „
Worse	19 „	10 „

He regards phrenicectomy as preferable to pneumothorax because it does not lead to complications and often gives sufficient rest to the lung to affect a cure and thus saves the prolonged treatment and refills. He remarks that, if unsuccessful, artificial pneumothorax can be induced later. One must remember, however, that delay in starting a pneumothorax may mean the formation of adhesions, which are the most common cause of failure of the treatment. Moreover, refills may be irksome for the patient, but they necessitate regular visits to his physician so that he is kept under close supervision for a long time.

E. Rist¹³ tabulated his first 200 hospital cases of phrenicectomy ranging from 1923 to 1931. Six or eight months after the operation he found 50 per cent so satisfactory that they suggested a lasting recovery. Reviewing the cases in November, 1933, however, he found 26 (13 per cent) definite recoveries, 16 (8 per cent) improved, and 86 (43 per cent) deaths. Of the 26 cases of recovery, 23 had also sanatorium treatment of from six to thirty months after the operation.

Allergy.—R. C. Wingfield¹⁴ has discussed the practical relationship of allergy to pulmonary tuberculosis. He believes that a secondary infection in the lung, be it endogenous or exogenous, sets up a local reaction just as a local reaction occurs in the skin when tuberculin is injected into a sensitive patient. This reaction injures the soft lung tissue and makes it a suitable focus for the growth of tubercle bacilli. He tries, therefore, to desensitize patients by the administration of regular doses of tuberculin so that these dangerous local reactions in the lung may be avoided.

Hæmoptysis.—A. Courcoux¹⁵ treated 20 cases of hæmoptysis by subcutaneous injections of oxygen. In 12 the hæmorrhage stopped at once, in 4 it stopped after the injection had been repeated daily for three or four days. He thinks that 500 to 600 c.c. of oxygen should be given under the skin of the chest, if possible on the affected side. Pierre-Bourgeois¹⁶ claimed good results, but thinks the site of the injection is not important and has

given it under the skin of the thigh. He also thinks smaller doses such as 200 c.c. are sufficient.

H. V. Morlock and A. J. Scott Pinchin¹⁷ point out the dangers of morphia or other drugs which tend to abolish the cough reflex in hæmoptysis. A clot of blood is apt to produce collapse of lung, and tuberculous bronchopneumonia may follow the retention of blood in the bronchial tubes. They have found *Congo red* of value in the treatment of hæmoptysis and advocate the intravenous injection of 10 c.c. of a 1 per cent solution. Larger doses may lead to severe rigors and collapse, and smaller doses are less effective. It is said to increase the monocytes, blood-platelets, and fibrin content of the blood, and to reduce the clotting time.

Gold Therapy.—Professor Sayé¹⁸ describes his experience of gold treatment in 434 cases. He regards the early exudative case as particularly suitable, and chronic fibrotic cases as unsuitable. He thinks the dosage should not be too small, and some of his patients had a total of over 20 grm. The individual dose and the intervals between them depend on the patient's tolerance.

Oleo-saucerysin or *solganal B* in oily suspension have been advocated on the grounds that they are better tolerated by the patient and do not produce toxic symptoms. It is stated that the gold is slowly absorbed, that its action is prolonged, and also that it is less toxic. A. Giraud,¹⁹ however, records cases of gastro-enteritis and dermatitis following *solganal B*.

C. Mayer²⁰ treats over 300 patients weekly in Paris with gold. Most of them attend the Laennec Hospital as out-patients. He varies his technique and dosage according to the state of the patient and the initial result of the treatment. In apyrexial cases, after a preliminary injection of 0.1 and a week later of 0.15 grm. of *crisalbine* in 5 c.c. of distilled water, he gives weekly injections of 0.25 grm. for four months. If there have been no reactions and the patient is improving, the injections are continued for another period of four months, when the dosage is again reconsidered. If there have been reactions, he continues the weekly injections, but as a solvent substitutes 10 c.c. of a 10 per cent solution of calcium gluconate (gluconyl) for 5 c.c. of distilled water. If after four months the patient has not improved or the disease has spread, though without reactions, he increases the dose to 0.5 grm., using 10 c.c. of the calcium gluconate solution. If after four months of this dosage there is still no improvement, he abandons the treatment. In febrile cases he uses gluconyl as a solvent and advocates 0.25 grm. *crisalbine* for six weeks, and then 0.5 grm. for six weeks, and then 0.75 or even 1 grm. if there has been no improvement. He continues treatment for many months, but when the sputum becomes free of tubercle the intervals between doses may be increased to a fortnight. He summarizes his results of 404 cases who had been under treatment for not less than six months, as one-third not influenced, one-third improved, and one-third much improved or cured.

Tests for Tuberculosis.—S. Lyle Cummins²¹ is of opinion that a positive tuberculin test is useless after 2 years of age. If negative to 1/100 it excludes tuberculosis unless loss of tuberculin sensitivity or anergy has been produced by some acute condition such as measles, influenza, or acute tuberculosis. He advocates finding the 'end point', i.e., the weakest solution to which patients react, and grading accordingly.

H. M. James²² describes a series of 407 patients having, or suspected of having, pulmonary tuberculosis. He tried both the sedimentation and Vernes flocculation test and found the figures of the two tests comparable, but the sedimentation test, being simpler and quicker, is more convenient. Both tests are of value for prognosis and control of treatment, but useless for diagnosis, as they are positive in other conditions besides tuberculosis. R. Murray,²³

after an exhaustive investigation, concludes that the Vernes test is not specific for tuberculosis, that in 6.6 per cent of cases with tubercle bacilli in the sputum it was normal (below 30), but that it does on the whole correspond with the sedimentation test.

B.C.G.—K. N. Irvine²⁴ has given a detailed account of the present position of B.C.G. His conclusions are that it is safe if prepared according to Calmette's instructions. If suitably grown, it may occasionally increase in virulence, and it has been known to produce progressive tuberculosis in animals, but in no case has this been proved to have occurred in the human subject. There can be little doubt that the Lübeck disaster was due to contamination.

A certain amount of immunity is produced in man by B.C.G., but its degree and duration have yet to be proved. If given orally, it is followed by sensitivity to tuberculin in some 20 per cent of cases, but 90 to 100 per cent give a positive tuberculin test after its subcutaneous injection. If cleanliness and reasonable precautions are taken, it is unlikely for the infant to meet with a dose of tubercle bacilli sufficiently large to cause progressive disease. It is the unknown carrier—for example, the one supposed to have chronic bronchitis—that is more dangerous than the known case of tuberculosis who can take precautions. The value of B.C.G. would therefore seem to be limited, but there is need for further research as to the degree of immunity it can produce.

Tuberculosis in Children.—L. G. Parsons²⁵ regards the alimentary view of tuberculous infection of the bronchial glands as absolutely untenable, and points out that the primary infection is in the lung and can usually be found as Ghon's focus. He stresses the danger of contacts to children, who are far more likely to become infected from some open case of tuberculosis than from milk. Tuberculosis in childhood is often benign, and complete recovery is a common occurrence, but the benign infection may develop into a most malignant one and cause death, usually from meningitis, which is mostly due to the human and not to the bovine type of bacillus.

A. S. Griffiths²⁶ found that 65.2 per cent of children who died from tuberculous meningitis from 0 to 4 years, and 69 per cent of those from 5 to 14 years, had the human type of bacillus. J. W. S. Blacklock²⁷ found that of 94 necropsies of children with primary lung tuberculosis all were of the human type, but of 64 with primary abdominal tuberculosis 54 (81.8 per cent) were bovine. In a large series of post-mortem examinations in infants he found it very rare to meet healed intrathoracic tuberculosis in those dead from some non-tuberculous cause.

Bovine Tuberculosis.—W. C. Savage²⁸ calculated that in England and Wales the deaths due to bovine tuberculosis in 1931 were 1716 (297 respiratory and 1419 non-respiratory). In the bovine cases nearly all deaths occurred in the age group 1-5. It is estimated that in England 40 per cent of cows react to tuberculin and 1 per cent have open tuberculosis—that is to say, are infectious. S. R. Gloyne²⁹ tested many samples of milk and found 128 (9.1 per cent) positive and 1285 (90.9 per cent) negative for tubercle bacilli after guinea-pig inoculation. Of 52 grade A tuberculin-tested samples 2 (3.8 per cent) were positive, and of 49 Grade A not tuberculin-tested 5 (10.2 per cent) were positive. Thirty samples of condensed milk were all negative.

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159; ¹⁶*Ibid.* 160; ¹⁷*Brit. Med. Jour.* 1934, ii, 762; ¹⁸*Cristoterapia de la Tuberculosis*, 1934, Barcelona; ¹⁹*Presse méd.* 1933, lxxv, 1456; ²⁰*Brit. Jour. Tuberc.* 1934, xxxviii, 131; ²¹*Clinical Jour.* 1933, Sept., 384; ²²*Med. Jour. Australia*, 1933, Aug. 26, 265; ²³*S. Afric. Med. Jour.* 1933, Oct., 645; ²⁴*The B.C.G. Vaccine*, 1934, Oxford University Press; ²⁵*Lancet*, 1934, i, 1101; ²⁶*Edin. Med. Jour.* 1932, xxxix, 277; ²⁷*Medical Research Council Special Report*, No. 172, 1932; ²⁸*Brit. Med. Jour.* 1933, ii, 905; ²⁹*Tubercle*, 1932, xiii, 443, 488.

TUBERCULOSIS, PULMONARY: SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

Phrenicectomy.—H. R. Decker¹ reports the results of phrenicectomy in 181 cases of pulmonary tuberculosis. The cases selected included moderately and far advanced disease, unilateral and bilateral, with or without cavitation, regardless of the site of the principal lesion. Minimal lesions in acute caseous febrile cases were not operated upon. Of this series, 28.7 per cent are well and working, 37 per cent are improved, in 13.3 per cent there was no change noted, and 21 per cent have died subsequently to operation, but in none of these was death attributable to the operation. Fifty-six patients were submitted to operation with a view to closing a sizable cavity. Complete closure resulted in 23.2 per cent and partial closure in a further 48.2 per cent. As regards the effect on symptoms, the sputum was diminished by the operation in 70 per cent, and in 40 per cent became negative for tubercle bacilli within one year. Cough was diminished in well over half the cases, and hæmoptysis ceased in 55 per cent. Decker states that favourable results were in direct proportion to the rise in the diaphragm. Further, he advocates crushing of the phrenic nerve as a trial procedure in extensive bilateral disease, especially in those with preponderance on one side, and in subacute unilateral spreading disease with the likelihood of spread in the other lung.

Apicolysis.—R. Monod² states that he has given up this operation after several attempts, for the following reasons: (1) In one case, during the operative separation by the posterior route of the lung from the chest wall, a cavity was opened. This resulted in the course of a few days in the death of the patient. (2) In two other cases the apicolysis, which was temporarily satisfactory, was followed later by the discharge of the wax. (3) In one case, two years after operation, suppuration around the wax had necessitated its operative removal. He states that his limited experience is hardly favourable to the method, although the recent results of certain other surgeons encourage them to revise their opinion.

L. S. Peters and P. G. Cornish,³ in addition to extrapleural plombage with wax, advise in selected cases, especially those in which the lung is hard and fibrosed, a modified apicolysis after performing an upper-stage thoracoplasty on the upper four or six ribs; the parietal pleura with the periosteum and intercostal bundles are then dissected off well down the spinal gutter and laterally for two or three inches. The anterior attachments of the apex are left undisturbed. The whole upper portion of the lung can then be compressed against the anterior chest wall and is pushed down with gauze bandage soaked in 25 per cent silver protein. The muscles and skin are closed over this, leaving sufficient opening at the lower angle of the wound to give easy access for repacking. The pack is removed and replaced by a new one until the lung is firmly set, after which the wound is allowed to granulate.

Thoracoplasty.—The tendency towards selective thoracoplasty indicated in the MEDICAL ANNUAL of last year (p. 496) still holds the field, especially in tuberculosis confined to the apex of the lung. This suggests a conservative attitude and shows a reasonable desire to preserve those portions of the lung which are not grossly diseased. Furthermore it has permitted the operative treatment of bilateral apical disease.

Jenson⁴ records his results in thoracoplasty in bilateral cases. In his opinion operability depends upon: (1) The general immunity; (2) The fibrotic character of the cavity; (3) The absence of myocarditis, even latent; (4) The relative rigidity of the mediastinum; (5) The capacity of retraction not yet ended; (6) Absence of extrapulmonary foci except in the throat; and (7) The general disposition of the patient in a physical and mental sense.

Among 140 cases of thoracoplasty observed during the last ten years, 25 suffered from a cavernous involvement of the so-called better lung. The results obtained in these patients following bilateral apical thoracoplasty were: (1) Completely restored, i.e., no bacilli, no fever, no toxic symptoms, 6 patients—24 per cent; (2) Practically restored, i.e., rare bacilli, no fever, no toxic symptoms, 9 patients—36 per cent; (3) Not improved, 3 patients—12 per cent; (4) Operative mortality, 3 patients—12 per cent; (5) Late mortality, 4 patients—16 per cent. These are remarkably good figures considering that they are patients with bilateral excavated disease of both apices, and, as Jenson states, it means the saving of 60 per cent of patients otherwise condemned to death. Doubtless failure resulted in the other 40 per cent, as the 3 patients without benefit from the operation will probably die of tuberculosis. These experiences show that surgical treatment depends first of all on the pathological condition of the patient, and that bilateral disease, if not too extensive, may prove amenable to surgical measures.

Intrapleural Pneumolysis.—Many reports on the division of adhesions complicating pneumothorax treatment have appeared in the last year. It is interesting to observe a partial return to the electric cautery as a means of division rather than, or combined with the use of, the diathermic cautery. In many cases preliminary coagulation of the adhesion by diathermic coagulation is followed by its division by the hot electric cautery. The value of this operation is unquestionable in selected cases, but it has to be remembered that in unsuitable cases and in unskilled hands the procedure may have a fatal termination. Cauterization into lung or cavity almost invariably results in the establishment of secondarily infected pleural effusions, which have an exceedingly high eventual mortality. R. C. Matson,⁵ in a paper describing this procedure, records results in 249 cases treated by galvanocautery and diathermic methods. Of these, 25·7 per cent were followed by a serous effusion, 16·5 per cent by purulent exudate, and 10·4 per cent by hæmorrhagic exudate. In 3 cases severe hæmorrhage resulted, and 4 patients developed a broncho-pleural fistula.

As regards the value of the operation, in 152 (61 per cent) patients it was technically and clinically successful. Of these, 32 were string adhesions; in 85 band adhesions only were present; in 18 fold adhesions, and in 4 all three types were encountered. In 19 cases partial division of adhesions was carried out with successful clinical results. The technically successful but clinically unsuccessful results numbered 2; one of these died from a spontaneous pneumothorax on the contralateral side seven days after operation, and the other of sudden profuse hæmorrhage from the collapsed lung one day after operation.

In his conclusions Matson states that it is unjustifiable to continue an unsatisfactory pneumothorax over a prolonged period because of the danger of extension of the disease to the opposite lung, to the gastro-intestinal tract, or to the larynx. His experience has demonstrated that intrapleural pneumolysis under thoracoscopic control will convert approximately 70 per cent of unsatisfactory cases of pneumothorax into satisfactory ones. If the adhesions prevent a satisfactory collapse of the lung after a probation of four to six months, it is very improbable that a satisfactory end-result will be obtained

by further continuation of the pneumothorax. If intrapleural pneumolysis is impracticable, other surgical collapse methods should be utilized.

G. L. Stivers⁶ has devised a light which can be inserted into the second cannula for transillumination of pulmonary adhesions. He calls this a 'thoracolum', and claims that vessels and extensions of cavities into bands can be determined with certainty by this method.

Tuberculous Empyema.—A. V. Lambert⁷ reviews the treatment of secondarily infected tuberculous effusions and recognizes that they have become more common since the extensive use of artificial pneumothorax treatment for pulmonary tuberculosis. In many cases the tuberculous nature of the underlying infection may not be apparent for some time; in others the pyogenic infection of a primary tuberculous pleurisy may be obvious. Necessarily their gravity is increased by the presence of a patent pleuro-pulmonary fistula.

The procedure recommended for patients who are not so seriously ill as to require immediate drainage is to replace the pleural fluid by air; 10 c.c. of a 1 per cent watery solution of gentian violet or crystalline violet is then left in the pleural cavity. This results in the exudate forming a jelly which must be removed by saline irrigation on subsequent days and the introduction of further gentian. If the septic manifestations cannot be controlled by this method, intercostal drainage is established through the tenth interspace. As soon as the pyogenic infection is controlled extrapleural thoracoplasty is undertaken. Where the pleura is thick and hard a modified thoracoplasty is performed. In this the sixth rib and transverse process are removed subperiosteally, and then the fifth, fourth, third, and second ribs are denuded of periosteum but left *in situ*. A portion of the first rib is now removed. The space between the denuded ribs on one side and the intercostal muscles and periosteum on the other is then firmly packed with gauze, pressing the parietal pleura, intercostal muscles, and periosteum over toward the mediastinum. The wound is then sutured in layers without drainage. After ten days the wound is reopened and the ribs and gauze pack are removed and again resutured without drainage. Where open drainage has been established there will always remain a comparatively small cavity near the diaphragm. Phrenicectomy will often suffice to close it, but according to Lambert this should not be done until the terminal stage. Frequent and repeated cauterization of persistent pleural sinuses with 95 per cent carbolic acid will often close them. Occasionally small and narrow tracts require opening and treatment as granulating wounds.

REFERENCES.—¹*Jour. of Thor. Surg.* 1933, ii, Aug., 538; ²*Bull. et Mém. Soc. nat. de Chir.* 1933, July 22, 1165; ³*Jour. Amer. Med. Assoc.* 1933, ci, Sept., 826; ⁴*Jour. of Thor. Surg.* 1934, iv, 1; ⁵*Surg. Gynecol. and Obst.* 1934, March, 619; ⁶*New Eng. Jour. Med.* 1933, ccix, Aug. 31, 437; ⁷*Ann. of Surg.* 1934, June, 944.

TUBERCULOSIS OF THE SKIN. (See SKIN, TUBERCULOSIS OF.)

TUBERCULOSIS OF THE SPINE. (See SPINE, TUBERCULOUS DISEASE OF.)

TUBERCULOUS PLEURISY IN CHILDREN. (See SEROUS PLEURAL EFFUSIONS IN CHILDREN.)

TULARÆMIA.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—In a paper on *tularæmic pneumonia*, J. R. Gudgeon,¹ who reports a personal case, states that 14 cases of tularæmia with necropsies have been recorded. In 1 case the chest was not examined, but of the remaining 13, 12 showed intrathoracic lesions of tularæmia and 8 definite pneumonia. The exact route by which the infection reaches the lungs, whether

through the blood-stream, lymphatic channels, or respiratory passages, is unknown. Gudger's patient was a man, aged 32, who became infected by cutting his thumb while cleaning rabbits. Symptoms of severe generalized infection developed together with evidence of pulmonary involvement. Death took place after a month's illness, and the necropsy revealed the characteristic lesion of tularæmia in the lungs and peribronchial lymphatic glands.

TREATMENT.—L. Foshay² treated 69 cases by serum made by inoculating goats subcutaneously with formaldehyde-killed suspensions of *Bacterium tularensis*. The injections were given subcutaneously, intramuscularly, and most frequently intravenously. The average date at which the serum was given was the twenty-first day of disease. There were 4 deaths. The average duration of the disease in the 69 cases was half that of the control series. In moderately severe cases two intravenous injections should be given on successive days in doses of 15 c.c. each of a serum made from animals inoculated with virulent strains of the organism. Much larger amounts must be given to cases of the typhoid type.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1933, ci, 1148; ²*Ibid.* 1447.

TYPHOID FEVER. (See also PARATYPHOID FEVERS.)

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—G. Nerlich¹ records ten examples of the coexistence of typhoid and paratyphoid fever in various parts of Germany since 1913, the most important being the epidemics at Munich (1928), Hanover (1926), Rostow on the Don (1926), Pforzheim (1925), and Schweinfurth (1932). His conclusions are as follows: (1) When typhoid and paratyphoid bacilli are found in the same patient during an epidemic of enteric fever, the infection is due to contaminated water or food and not to contact; (2) There is no evidence that one form of organism is converted into another.

H. Deimer² describes an outbreak of typhoid fever which occurred at Jassy in the north-east of Roumania, where there were 80 cases with 14 deaths from December, 1930, to March 31, 1931. The ages of the patients ranged from 1 year to 64 years, but the great majority were between 5 and 30. The outbreak was due to fecal contamination of the water-supply resulting from defective sewerage. The population became immunized partly by inoculation and partly by repeated ingestion of very small quantities of typhoid bacilli in the drinking water.

G. Hornus³ discusses the seasonal prevalence of typhoid fever in various sections of the French army in France, Germany, North Africa, and the Levant, and comes to the conclusion that in every climate typhoid fever tends to be most frequent in the spring and autumn. Under satisfactory hygienic conditions typhoid fever is mainly a spring disease, but otherwise the rise chiefly takes place in the autumn. The spring rise is probably due to individual susceptibility, while the autumn rise is attributed partly to increased susceptibility but mainly to increase in the number and virulence of the organisms.

The twenty-second annual report of the *Journal of the American Medical Association*⁴ on the ninety-three cities of the United States with a population of more than 100,000, shows that for the first time in the history of these reports no city registered a typhoid mortality rate higher than 10 per 100,000, and sixteen cities had no typhoid deaths at all.

SYMPTOMS AND COMPLICATIONS.—M. Macquart-Moulin⁵ reports 33 cases of typhoid fever in children aged from 14 months to 14 years, due to consumption of shellfish contaminated by sewage at Havre. The principal symptoms were the abnormal frequency of myocarditis and collapse, the peculiar physiognomy of the patients, which was one of hebetude without real prostration, the

frequency of constipation, and the absence of intestinal hæmorrhage and perforation.

H. Poudevigne⁶ states that the rare complication of *non-perforative peritonitis*, of which he records ten examples in patients aged from 6 to 43, is most frequently but not exclusively found in severe attacks of typhoid or paratyphoid. The symptoms do not differ from those of perforative peritonitis. The diagnosis is difficult, especially if the existence of enteric fever has not been suspected. The prognosis, though grave, is better than that of perforative peritonitis. Of Poudevigne's 10 cases, 4 recovered—2 without operation—and 6 died, on 3 of whom laparotomy had been performed.

P. Hillemand, J. Mézard, and G. Valensi,⁷ have collected five cases, two of which are original, of cholecystitis occurring at the onset of typhoid fever, for which they suggest the name of *cholecysto-typhoid* on the analogy of pneumo-typhoid, meningo-typhoid, etc. Clinically there is nothing to suggest the real nature of this pre-typhoid cholecystitis. In four cases the diagnosis was not established until after the appearance of rose spots or the result of blood culture. The diagnostic value, however, of early epistaxis and leucopenia in such cases is emphasized.

P. Lessard⁸ describes the following *electrocardiographic changes* which he found in 17 out of 32 cases of typhoid fever in patients aged from 17 to 49: sinus arrhythmia, extrasystoles, sinus bradycardia, auricular fibrillation, disturbance of auriculo-ventricular conduction, and changes in the ventricular complexes. The frequency of electrocardiographic anomalies bore a direct relation to the clinical severity of the disease, abnormal tracings being found in 12.5 per cent of the mild cases, in 55 per cent of the moderate, and in 73 per cent of the severe. Too much prognostic importance, however, should not be attributed to the electrocardiographic method, as patients may die with normal tracings; but a persistent change in the electrocardiogram in convalescence from typhoid fever should be regarded as of evil omen for the future. From examination of the heart in 28 cases of typhoid and paratyphoid in children aged from 3 to 14 years, A. Willm⁹ comes to the conclusion that the electrocardiographic changes in enteric fever in children are practically the same as those in adults. Like Lessard he found that though the most pronounced changes were present in severe attacks there was frequently a dissociation between the electrocardiographic and the clinical signs. As regards the remote prognosis, none of the patients examined several months or years after the attack of enteric fever showed any electrocardiographic changes indicating persistence of the cardiac involvement.

H. Wolf¹⁰ states that *hæmaturia* may occur at any stage of typhoid fever, viz., at the onset as nephro-typhoid, at the height of the disease, or later, when it may assume a very severe character. It may sometimes be due to urotrypine, in which case it ceases as soon as the drug is discontinued.

W. Rubinstein¹¹ records eight cases of *suprarenal insufficiency* in typhoid fever, which was manifested by a typhoid state, prostration, and low blood-pressure. This complication is most liable to develop in severe forms of the disease. Slight suprarenal involvement in typhoid fever may be the origin of a slowly developing syndrome of suprarenal incompetence at a more or less distant date. The diagnosis is of the utmost importance, as the prognosis depends on the early application of treatment by adrenalin or suprarenal extract.

M. Sicard¹² describes a *catatonic syndrome*, apparently of toxic origin, occurring in typhoid fever and characterized by catalepsy, negativism, and hyperkinesis. It is sometimes accompanied by other evidence of nervous involvement, such as disturbance of the reflexes and an extensive plantar response.

PROPHYLAXIS.—From experience of antityphoid inoculation in the Polish army and civilian population M. Kacprzak¹³ found that the incidence of the disease was fairly high in the inoculated, although better results were obtained by subcutaneous injection than by administration of the vaccine by mouth in the form of pills. The essential measures in the prevention of typhoid fever appeared to be purification of the water-supply, proper disposal of excreta, supervision of the food-supply, individual cleanliness, and sanitary education of the population.

TREATMENT.—From experience of *Rodel's serum*, which is both bactericidal and antitoxic, in 12 enteric patients aged from 13 to 40, J. Barot¹⁴ comes to the following conclusions: It is useful in typhoid fever or paratyphoid A, but has no effect in paratyphoid B infections. The earlier the treatment is applied the better are the results. In cases in which the serum is given on the second or third day of disease, the attack may be aborted. An injection given between the fifth and eleventh day still has a favourable action, but after the twelfth day is much more uncertain in its effect. The first dose should be 20 c.c., and should be followed, if no result has been obtained, by another dose. In severe cases 20 or 25 c.c. may be given for the first dose, and the following injections should consist of progressively decreasing doses, viz., 15 c.c. for the second and 10 c.c. for the third. There are no contra-indications to the use of the serum.

C. Dubreil¹⁵ found that intramuscular injections of *iodobismuthate of quinine* in oily suspension as recommended by Sahli, of Berne, in doses of 3 c.c. every other day, reduced the temperature, caused disappearance of diarrhoea, improved the general condition, and shortened the duration of the disease.

G. H. Bigelow and G. W. Anderson¹⁶ report the histories of 12 typhoid carriers aged from 29 to 68, 6 of whom were men and 6 women, in whom after failure of medical measures cure of the carrier state was effected by removal of the gall-bladder. They recommend that carriers who have undergone cholecystectomy should be kept under observation for at least a year by monthly examination of specimens of the stools, and not finally released until a negative bile culture has been obtained.

REFERENCES.—¹*Arch. f. Hyg.* 1934, cxii, 1; ²*Thèse de Paris*, 1934, No. 180; ³*Rev. d'Hyg. et de Méd. prev.* 1934, lvi, 332; ⁴*Jour. Amer. Med. Assoc.* 1934, cii, 1677; ⁵*Thèse de Paris*, 1933, No. 387; ⁶*Ibid.* No. 599; ⁷*Paris méd.* 1934, i, 47; ⁸*Thèse de Paris* 1933, No. 312; ⁹*Ibid.* 1934, No. 321; ¹⁰*Ibid.* No. 171; ¹¹*Ibid.* No. 130; ¹²*Ibid.* No. 5; ¹³*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 110; ¹⁴*Thèse de Paris*, 1933, No. 300; ¹⁵*Ibid.* No. 492; ¹⁶*Jour. Amer. Med. Assoc.* 1933, ci, 348.

TYPHUS FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to the Report issued by the Health Section of the League of Nations¹ typhus in Europe was practically confined to the eastern part of the Continent, apart from the Iberian Peninsula and the Irish Free State, where there were a few sporadic cases. As in the previous year (see MEDICAL ANNUAL, 1934, p. 503), the chief focus of typhus in Europe was Soviet Russia, where there was a very marked increase at the end of the winter of 1931-2 and a decline in 1933. There was a slight increase in the endemic in Sub-Carpathian Russia, Poland, and Roumania, a decided increase in Yugoslavia, and a reappearance of the disease in Eastern Hungary, where only sporadic cases had occurred since the last epidemic of 1923-4. In Asia typhus showed an endemo-epidemic prevalence in Soviet Russia, with exacerbations in 1932, especially in Western Siberia, and in Persia. In Turkey it was on the decline in 1932, but showed an increase in 1933. In China, Manchuria, and Chosen the disease was present in endemo-sporadic form, whereas in Japan it did not succeed in taking root, only three cases occurring

in 1932 and two in 1933 in that country. Tropical typhus showed the same low incidence in the Malay Peninsula and Sumatra as in previous years. Sporadic cases of mild typhus are also met with in Australia, especially in the west. In the United States the marked increase in the incidence of endemic typhus, if not in the area covered by the disease, was mainly due to improvement in diagnosis. In Mexico the endemic, though severe, was practically stationary, if not on the decline. In South America sporadic cases were notified in 1932 and 1933 in Venezuela and Argentina, but epidemics were reported in Peru, Bolivia, and especially in the central part of Chile. In Africa a serious epidemic took place in Lower Egypt in 1932 and 1933; the disease was also epidemic in the Constantine department of Algeria in 1933 and endemic in Morocco and Tunis, while in the Union of South Africa typhus has been definitely spreading during recent months except in Cape Colony and Rhodesia.

Cases of endemic typhus, corresponding in all essential features to Brill's disease, are reported by A. C. Ernstone and J. E. F. Riesman² as having occurred in Boston from 1929 to 1932. In no instance was more than one person in a family affected. Six of the cases occurred during the warm months. A positive Weil-Felix reaction was obtained in eight.

According to Mohammed Shahin Pasha³ typhus which had been endemic in Egypt since 1911 reached its height in 1916, when there were 30,507 cases. A decline subsequently took place until 1931, when only 265 cases were notified. In 1932, however, when the financial crisis led to malnutrition and lack of hygiene and individual cleanliness among the poorer classes, the disease resumed epidemic proportions, so that there were 2298 cases in 1932, with a fatality rate of 17 per cent, and 6621 cases from Jan. 1 to July 29, 1933, with a fatality rate of 12 per cent.

An outbreak of 82 cases of typhus in the Western Province of Uganda in June, 1932, is reported by R. S. F. Hennessey⁴: 36 were males and 46 females; 63 out of 70 whose ages were recorded were between the ages of 10 and 30. Eight died—a fatality of 9.7 per cent. The clinical picture resembled that of the European form of typhus. The high degree of infestation with the body louse made it probable that this parasite played an active part in the transmission of the disease, and this view was confirmed by inoculation of guinea-pigs, which developed a definite form of pyrexia of from four to ten days' duration.

L. V. R. Jude, L. H. D. H. Martin, and J. V. H. Lubet⁵ report a severe epidemic of typhus which occurred in North Syria in the spring of 1933. Of about 600 cases nearly 300 were fatal.

According to J. Godinez-Rivera⁶ in Mexico typhus is most prevalent in the capital and the towns of the central plateau, where the disease is endemic, with occasional more or less severe epidemics during the winter. The disease in Mexico is transmitted by rats and fleas and not by the clothes louse, which is not found in that country. In Mexico City the average annual mortality during the last thirty years per 100,000 inhabitants has been as follows: 1896-1905, 173.5; 1906-15, 144.5; and 1916-23, 76.6. In 1932 it was only 5.2, but in 1931 it was 30.9 owing to an epidemic during the first few months of the year.

PROPHYLAXIS.—W. Chodzko⁷ reports on the use against typhus of *Weigl's vaccine*, which is prepared from the intestines of lice artificially infected with *Rickettsia prowazeki*. During 1931 and 1932, 2794 persons, consisting of 131 doctors, 517 individuals employed in sanitary services, and 2146 others who had been exposed to infection, were inoculated with very satisfactory results, although the duration of the immunity conferred had not yet been established.

Godínez-Rivera⁶ reports good results following the use of the Zinsser and Ruiz-Castañeda vaccine, which was prepared from the tunica vaginalis of infected rats and given subcutaneously in increasing doses of 0.5, 1, and 1.5 c.c., with an interval of a week between the first and second and second and third doses. The duration, however, of the immunity so conferred was not determined.

TREATMENT.—A. Babalian⁸ treated 16 severe cases in young men by intramuscular injection of 10 c.c. of their own blood. Each injection was followed by an immediate improvement in the general condition, and the duration of the disease appeared to be shortened by a series of four or five injections.

REFERENCES.—¹*Epid. Rep. Health Sect. League of Nat.* 1933, xii, 258; ²*New Eng. Jour. Med.* 1933, clix, 542; ³*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 83; ⁴*East Africa Med. Jour.* 1934, xi, 42; ⁵*Arch. Méd. et Pharm. mil.* 1934, c, 693; ⁶*Thèse de Paris*, 1934, No. 155; ⁷*Bull. Off. internat. d'Hyg. publ.* 1933, xxv, 1549; ⁸*Bull. Path. Soc. exot.* 1934, xxvii, 235.

TYPHUS, TROPICAL.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The occurrence of varieties of typhus fever in the tropics continues to attract attention, and J. W. D. Megaw^{1,2} has well summarized the present state of our knowledge of the subject in his latest classification into epidemic louse-borne typhus, mainly of Europe and North Africa, and non-epidemic typhus, mainly of warm climates, which he subdivides, in accordance with the carriers, into tick-, mite-, and flea-borne, and typhus of unknown vector.

Important researches by L. Anigstein³ in Malaya have been published which clarify the subject by bringing the tropical forms of the disease into closer relationship with the original European variety, of which this worker had experience in Poland during the Great War. In the course of two years' investigation of Fletcher's scrub typhus or K type, on account of the patients' blood giving the Weil-Felix reaction with the K type of *B. proteus*, and of the urban form reacting with K19 (W) strain, he succeeded in transmitting tropical typhus to guinea-pigs and rats, and in finding Rickettsia-like micro-organisms in the tunica vaginalis of these animals which showed the typical congestion. He also cultivated a pleomorphic organism from the animals and from cases of tropical typhus, which gave serological reactions with the X group of *B. proteus* of both the K and the K19 (W) types. Further, after passage through guinea-pigs and rats, he produced typhus fever in a human volunteer by injecting him with a portion of the brain of an infected animal, thus completing the proof that endemic typhus in the tropics is associated with Rickettsia bodies, just as the European epidemic form is. In all, he isolated 76 strains of the organism from human and animal cases, and he obtained every stage from Rickettsia-like ones, bipolar staining coccobacilli, and spindle-shaped organisms, up to *proteus* forms closely resembling those of European typhus. To complete the analogy between the epidemic and endemic forms he took lice out with him to Malaya and fed them on tropical typhus patients, with the result that the lice died with the development in them of enormous numbers of micro-organisms similar to those of European typhus. Practically important results were also obtained, for he made a vaccine from his cultures and used it for prophylactic inoculation of the coolies working on a palm-oil estate on which numerous cases of tropical typhus had occurred; he was able to report a rapid decline in the incidence of the disease, and that only one case subsequently appeared among some 300 men inoculated with two doses of the vaccine.

A case of typhus in Burma has been reported by C. de C. Martin and L. A. P. Anderson,⁴ which clinically resembled scrub typhus of Malaya, and on testing the convalescent's serum it gave reactions with Kingsbury strain of *proteus* OXK from Malaya, although during the fever negative reactions had been obtained

with *OX19 proteus*. Widal tests for typhoid were also negative, and there was a history of painful insect bite before the attack.

The difficult question of the *technique of the Weil-Felix reaction in tropical typhus* is discussed by R. F. Bridges,⁵ who points out that the *proteus* group of organisms grows in two distinct forms, firstly in a continuous surface spreading film of motile flagellate bacilli, the H variety, and secondly in the O form consisting of separate non-spreading colonies of non-flagellate organisms, which alone are used for blood-tests, as they contain only the somatic or O antigen. There are also three strains, X2 and X19 giving similar reactions, only the latter furnishes them in titres of 1-5000 to 1-10,000, which is ten to twenty times the dilution that X2 does, so it is mainly used. A third variety XK, or the Kingsbury strain, was taken out to Malaya by Dr. Kingsbury, and sometime later found by Fletcher to give reactions in his scrub or country type of Malaya typhus, which gave negative reactions with the ordinarily used X19 type. Thus both forms are required in carrying out the Weil-Felix reaction in endemic or tropical typhus, the O forms always being used.

Six cases of typhus have been reported by A. Babalian in Persia⁶ and treated with good results by intramuscular injections of 10 to 15 c.c. of the total blood of the patient (autohæmatotherapy). The potential transmission of Rocky Mountain spotted fever by eight species of North American ticks is reported on by R. R. Parker, C. B. Philip, and Wm. L. Jellison,⁷ who fed them on the blood of infected rabbits and guinea-pigs and subsequently injected emulsions of them in various stages of their life-history into healthy male guinea-pigs to ascertain if they had become carriers of the virus. This form of typhus has been found to be increasingly prevalent far beyond the Rocky Mountain area in which it was first detected, and maps of the distribution of the proved possible carriers of the infection show that between them the proved species of ticks cover nearly the whole of the United States. The long-recognized natural carriers of the infection to man are the *Dermacentor andersoni* and the rabbit tick, *Hæmaphysalis leporis-palustris*, to which a third, *D. variabilis*, has recently been added.

REFERENCES.—¹*Brit. Med. Jour.* 1934, ii, 244; ²*Ind. Med. Gaz.* 1933, Aug., 462; ³*Studies of Instit. Med. Research Federated Malay States*, 1933, No. 22; ⁴*Ind. Med. Gaz.* 1933, Aug., 432; ⁵*Jour. R.A.M.C.* 1934, Feb., 102; ⁶*Bull. Soc. Pathol. exot.* lxiii, No. 2, 102; ⁷*Amer. Jour. Trop. Dis.* 1933, July, 341.

ULTRA-VIOLET IRRADIATION. G. E. Oates, M.D., M.R.C.P., D.P.H.

The Significance of Pigmentation in Ultra-violet Irradiation.—The association of good health and general well-being with exposure to the sun's rays and the consequent bronzing of the skin is so instinctive in temperate countries that one is apt to conclude that the development of pigmentation is a necessary part of the beneficial reaction induced by ultra-violet radiation. Indeed, there have been so many excellent results obtained, notably in cases of rickets and surgical tuberculosis, where the maximum depth of pigmentation has been maintained by repeated exposure to natural or artificial ultra-violet rays, that many clinicians regard deep pigmentation as essential to the successful treatment of these and other conditions. P. R. Peacock,¹ as a result of experimental studies, has come to the conclusion that pigmentation plays little or no part in the general constitutional response to ultra-violet rays, and regards it as a by-product of the erythema reaction and not as a specific reaction to the rays. It is generally recognized that the biologically active region of the ultra-violet spectrum lies between 3000 and 2000 Ångström units, known as the 'far' ultra-violet rays, and that the 'near' ultra-violet region, from 3800 to 3000 Ångström units has not the specific antirachitic and bactericidal properties associated with the shorter wave-lengths. The latter are also responsible

for producing the typical erythema reaction or sunburn, but their power of penetration in the tissues is very slight and has been estimated by various observers as about 0.1 mm. for human skin. Most of the energy of these therapeutically potent rays must, therefore, be dissipated in the epidermis and, exceptionally, in the superficial structures of the dermis, where the tips of the papillæ come within 0.1 mm. of the skin surface. A single exposure of normal white skin to the 'far' ultra-violet rays in suitable dosage is followed by a latent period of one or more hours, during which no macroscopic change is observed; thereafter, a progressive degree of erythema develops, and, after reaching a maximum in about twenty-four hours, it gradually diminishes in intensity and is replaced by pigmentation of the erythematous area. At the time of development of pigmentation, a variable amount of desquamation of the horny layer of the epidermis occurs, and at this stage there is histological evidence of active proliferation of all the layers of the epidermis, nucleated cells being found in the normally structureless horny layer.

The author has carried out observations on frozen sections of skin illuminated by a beam of ultra-violet rays in such a way that any fluorescence of the structures may be observed. He finds that normal white skin examined in this manner shows distinct layers of fluorescent and non-fluorescent structures. Most of the ultra-violet light impinging on the skin is converted into ordinary light by the fluorescence of the horny layer of the epidermis. A variable amount penetrates to the dermis, where fluorescence can be seen, provided that the layer of melanin in the basal layer does not absorb it. The transformation of ultra-violet rays into harmless light rays is a protective mechanism of nature and is the basis of the various anti-sunburn oils, which protect the underlying skin by intercepting the ultra-violet rays in this manner. The action of ultra-violet rays on the living cells of the epidermis is profound and destructive, but since very few pass through to the dermis it remains to be discussed how the erythematous reaction is brought about. This dilatation of the capillaries of the dermis is only brought about after a latent period, and the author makes the following suggestion, namely, that the destructive action of the rays on the cells of the epidermis liberates from these a soluble substance, which slowly diffuses into the lymph spaces and so reaches the dermis, where it produces a vasodilator effect.

Peacock considers that the development of pigmentation in the basal layer is only significant of the degree of the preceding erythema. It is unlikely that the presence of melanin in the basal cells can have any constitutional beneficial effects, owing to the insoluble nature of melanin. Pigmentation merely represents one of the signs of increased metabolic activity of the basal cells of the epidermis, which normally produce a small quantity of melanin. This theory is further confirmed by the fact that pigmentation of the skin follows after exanthematous rashes, and in skin diseases where there is prolonged erythema, such as pityriasis rosea and secondary syphilitic rashes. Once established, pigmentation forms an effective filter, preventing the penetration of ultra-violet rays to the dermis. It follows that if it is desired to obtain the maximum absorption of ultra-violet light rays by the skin of a patient, it seems desirable to avoid marked reactions, with consequent pigmentation and thickening of the horny layer of the epidermis. Furthermore, the increased tolerance of patients to repeated doses of ultra-violet rays is apparent and not real, and is explicable as an increasing resistance to penetration of the rays on the part of the skin.

Effects of Solar Irradiation.—E. C. Dodds, J. D. Robertson, and H. J. Roche² have investigated the effects of solar irradiation on children, with special reference to hypervitaminosis. Forty-eight children suffering from various orthopædic conditions, tuberculous and otherwise, and under treatment at the

country branch of the Royal National Orthopædic Hospital. were subjected to natural sunlight. Biochemical examinations of the blood, urine, and faeces were made. The blood calcium and phosphorus values were observed to increase during the period of exposure to the rays of the sun, but there were no ill effects whatever and no evidence of hypervitaminosis.

On the other hand, A. H. Gosse and G. S. Erwin³ noticed that a number of patients appeared in their wards towards the end of the hot summer of 1933 with recently developed pulmonary tuberculosis, and heavily tanned from sun-bathing. After a careful study of 11 such typical patients the authors are of opinion that the abnormal exposure of the usually covered skin surfaces to the action of the sun's rays aggravated the development of pulmonary tuberculosis in these cases. This is in accordance with the recognized danger of treating pyrexial cases of this disease with insolation or by artificial sunlight. They emphasize certain other conclusions. It is inadvisable for persons who have recently lost weight or who are feeling abnormally tired to sun-bathe unless the possibility of chest trouble has been eliminated by a clinical examination. Even more so is this the case where there has been a recent hæmoptysis. Sun-bathers who feel tired or feverish, or who perspire at night after a sun-bath, should take their temperature, and, if it is above 99° in the evening, no more sun-baths should be attempted until they have been passed as fit.

REFERENCES.—¹*Brit. Jour. Physical Med.* 1934, viii, March, 173; ²*Arch. of Dis. Child.* 1934, ix, 91; ³*Brit. Med. Jour.* 1934, July 7, 15.

UNDULANT FEVER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

TREATMENT.—What may prove an important advance is reported by I. F. Huddleson and H. W. Johnson,¹ who have used a substance they call 'brucellin' made in the following manner. Separate beef liver infusion broth cultures of three species of *Brucella* were grown for sixty days at 37° C. The broth was then clarified by centrifuging at 3000 revolutions for four hours, the clear liquid decanted, adjusted to a pH of 7, passed twice through sterile Berkefeld N filters, and tested for sterility. After two years' trials the following dosage has been adopted. The sensitiveness of the patient is first tested by an intradermal injection of about 0.05 to 0.1 c.c. of brucellin, and if no marked systemic reaction occurs within twenty-four hours, 1-c.c. doses are injected intramuscularly at three-day intervals up to four doses; but if there is a systemic reaction to intradermal injection, a start should be made with a dose of only 0.1 to 0.2 c.c. and doubled at each successive dose in the absence of systemic reactions until 1 c.c. is reached; in those still showing very little systemic reaction it may be gradually increased up to 3 to 5 c.c., especially in chronic cases. No fewer than 80 cases have been treated, and notes of 12 are given. The best results are obtained in early cases, for in those of up to three months' duration complete recovery was usually obtained within twelve to fifteen days. Brucellin should never be injected intramuscularly into a patient who has recovered from the disease, for fear of dangerous reactions. The number of cases successfully treated appears to leave no doubt regarding the value of the treatment, which is worthy of further trials in the absence hitherto of any satisfactory method of cutting short the disease.

REFERENCE.—¹*Amer. Jour. Trop. Med.* 1933, Sept., 485.

URETER, SURGERY OF. (See also BLADDER, SURGERY OF.)

Hamilton Bailey, F.R.C.S.

Ureteric Calculus.—In spite of the efforts of genito-urinary evangelists, pitfalls in the diagnosis of ureteric calculi are not yet realized sufficiently by the profession. Sir William Wheeler¹ trains his diagnostic searchlight upon the large group of atypical cases, revealing these points:—

1. *The pain is often entirely epigastric and a barium meal is ordered. If only radiologists would make it a routine practice to take a plain X-ray before starting a barium meal, a number of this group would come to light automatically.*

2. *The symptoms resemble those of appendicitis. One out of five cases of ureteral calculi bear the imprint of a mistaken diagnosis in the shape of an appendicectomy scar.*

3. *Painful nocturnal emissions and blood-stained semen can be produced by a stone in close relationship to the seminal vesicles.*

4. *A ureteral calculus occasionally does not cast an X-ray shadow, and its presence must be established by ureteral catheterization and pyelography.*

G. J. Thompson and H. C. Bumpus² studied 1001 case histories of stone in the ureter. *Classical renal colic with pain passing to the groin is exceptional.* More often the pain radiates from the loin towards the umbilicus. Calcified lymph-nodes in the line of the ureter are a constant source of temporary perplexity in radiological diagnosis. Re-X-raying after the passage of an opaque ureteric catheter soon clarifies the situation. R. Lacks³ has met with examples of a calcified gland adherent to the ureter being the source of repeated ureteric colic.

A ureteric calculus frequently becomes impacted in the lower third of the ureter. P. P. T. Wu⁴—experimenting on dogs—found that the lower third of the ureter is possessed of far less peristaltic power than the middle and, particularly, the upper thirds.

TREATMENT.—

Expectant Treatment.—If the calculus is shown by X-rays to be small, and the patient is having attacks of ureteric colic, there is a fair chance that the stone will pass naturally. The patient is encouraged to drink large quantities of bland fluid; urinary antiseptics and antispasmodics, such as atropine gr. $\frac{1}{100}$, or, better, tinct. ammi visnaga, 5 c.c. to 10 c.c. well diluted with water, t.d.s., are prescribed. If at a second

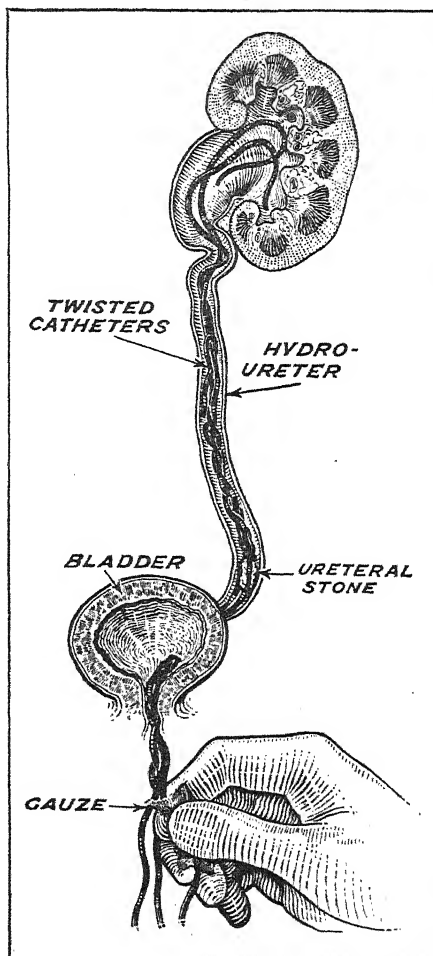


Fig. 53.—Entangling a ureteric stone in three ureteric catheters. (After H. C. Bumpus.)

X-ray examination the stone is shown to be still in the same location in spite of expectant treatment, instrumentation should be used.

Instrumental Treatment.—The passage of a ureteric catheter, leaving it in for two days, is often attended by the expulsion of the stone. Entangling the stone in a little faggot of ureteric bougies (*Fig. 53*) has been described and practised successfully by B. Huneberg⁵ and also by G. J. Thompson. Three ureteric bougies are passed up the ureter and are allowed to remain there for forty-eight hours. They are twisted round each other, and then slowly with-

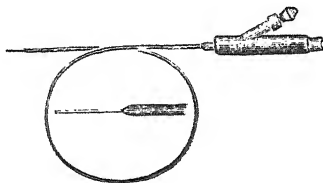


Fig. 54.—An electro-surgical ureteric meatome.

drawn, thus pulling the stone into the bladder. When the ureteric orifice is but a pin-hole, or obviously too small for the passage of the stone, meatotomy, preferably employing a diathermy meatome (*Fig. 54*), is often of considerable assistance.

In the female the lower end of the ureter is a near relation of the lateral fornix. O. Weidner⁶ was able on two occasions to express a calculus from the ureter into the bladder by bimanual manipulation.

Operative Treatment.—While instrumental methods have gained in favour, open operative removal is attended with no additional risk (Sir William Wheeler). When the stone is greater than 1.5 cm., when infection has supervened, or when the excretion pyelogram shows that the pelvis of the kidney above the stone is becoming hydronephrotic, watchful waiting and instrumental methods are out of place. Sir William favours the extraperitoneal approach to the lower third of the ureter through an incision comparable to the gridiron incision for appendicectomy.

S. Rolando⁷ finds that when operating upon fat persons cotton gloves over the ordinary rubber gloves considerably facilitate uretero-lithotomy.

Extravasation of Urine from the Ureter Secondary to Ureteric Calculus.—The commonest cause of extravasation of urine from the ureter is impaction and ulceration of a stone near the pelvi-ureteric junction. The symptoms are those of severe renal colic followed by a brawny swelling in the loin. Only rarely does the stone extrude through the rent in the ureter (G. S. Foulds and D. H. Vairey⁸).

Anastomosis of the Accidentally Divided Ureter.—Scepticism exists as to whether anastomosis of a divided ureter is worth while. It is therefore opportune to have concrete information concerning the end-results of this operation. In 1907 W. Fossell⁹ accidentally cut a ureter. He effected immediate repair by removing the mucosa from the mouth of the divided lower end and invaginating the upper into the now more commodious lower portion. In 1923 the kidney function on that side was perfect and a ureteric catheter could be passed with ease. Cysto-ureteric anastomosis has been performed more frequently than the above, and there is a good deal of evidence to show that the end-results are not as good as one would hope. However, the operation is sometimes very satisfactory. M. Sauve¹⁰ divided a ureter and implanted it into the bladder. Four years later the kidney on that side

was functioning well. Quénu and Fey¹¹ report a similar case in which the kidney function was good at the end of a year.

From time to time cases are encountered where enormous dilatation of the ureters can be demonstrated without any obstructive lesion to account for the dilatation. It has long been thought that the dilatation was due to an inco-ordination of the neuromuscular mechanism of the ureter. Acting on this hypothesis, R. O. Ward¹² resected the presacral nerve in a flagrant example of this condition. The result appears to have been brilliant. Eleven months after the operation the ureters were of normal size and the patient was free from symptoms.

A Study of the Vesical End of the Ureter in Congenital Hydronephrosis.—H. L. Kretschmer and W. C. Hibbs¹³ studied at necropsy 15 specimens of hydronephrosis in children varying in age from 1 month to 10 years. The underlying pathology was essentially obstructive in nature, and usually congenital in origin. There were two groups of hydronephroses: (1) Three cases of true fibrous stricture of the ureter; in all these the ureter had an anomalous insertion. (2) In 12 specimens the ureteric obstruction was due clearly to hypertrophy of the muscular coat, chiefly the longitudinal fibres. In 10 of the 12 cases there were obstructive lesions such as congenital valves of the posterior urethra, and the ureteric hypertrophy was secondary to these obstructions. No mechanical obstruction could be found in the 2 remaining specimens. One was from a child with ectopia vesicæ and the other from a case of post-diphtheritic paralysis.

Tumours of the Ureter.—Tumours of the ureter, which are not common, have received considerable attention in the literature of this year.

Simple Papilloma.—Benign papilloma identical with a bladder papilloma usually extends from the pelvis of the kidney.

Malignant Papilloma.—This is the commonest ureteric neoplasm, and W. W. Scott¹⁴ says that it metastasizes earlier than its sister lesion in the bladder.

Non-papillary Carcinoma.—These carcinomata constitute about 40 per cent of malignant growths of the ureter (J. A. Lazarus¹⁵).

Sarcoma.—Sarcoma of the ureter is very uncommon. S. Bergendal¹⁶ details a case in a man of 28. Metastases in the lung occurred six months after removal.

Tumours of the ureter should be suspected when copious bleeding follows the passage of a ureteric catheter (J. B. Gilbert¹⁷). A filling defect in the ureterogram is of high diagnostic importance.

TREATMENT.—*Nephro-ureterectomy* is the operation of choice. On the whole the prognosis is not good, largely owing to the difficulties attending early diagnosis, but one patient is known to be alive eight and a half years after the operation.

REFERENCES.—¹*Practitioner*, 1933, Nov., 533; ²*Proc. Staff Meetings, Mayo Clinic*, 1933, July 5, 405; ³*Zeits. f. urol. Chir.* 1933, April, 111; ⁴*Jour. of Urol.* 1933, Sept., 307; ⁵*Acta chir. Scand.* lxxii, 134; ⁶*Deut. med. Woch.* 1934, March 23, 441; ⁷*Jour. d'Urol.* 1933, Aug., 145; ⁸*Brit. Jour. Urol.* 1934, March, 27; ⁹*Acta chir. Scand.* 1932, Dec., 245; ¹⁰*Bull. et Mém. Soc. nat. de Chir.* 1932, Nov. 26, lviii; ¹¹*Ibid.*; ¹²*St. Bart's Hosp. Rep.* 1933, lxvi, 17; ¹³*Surg. Gynecol. and Obst.* 1933, Aug., 170; ¹⁴*Ibid.* 1934, Feb., 215; ¹⁵*Ann. of Surg.* 1934, xcix, May, 769; ¹⁶*Acta chir. Scand.* 1934, Feb., 179; ¹⁷*Surg. Clin. N. Amer.* 1933, April, 488.

URETHRA, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Stricture of the Urethra.—H. C. Bumpus¹ finds that in some cases of dense stricture considerable time can be saved by continuous dilatation. After a filiform has been passed its continuous presence in the urethra for twenty-four hours permits of the attachment and passage of a small-sized Phillips' catheter. This in turn, by continuous pressure, so enlarges the stricture that

the following day a No. 16 or 18 French can be passed, and if in turn this is allowed to remain in place for another twenty-four hours, the stricture will have so dilated that the patient can be treated in the routine manner of dilatation with steel sounds.

In cases of dense traumatic stricture following rupture of the bulbous urethra complete excision of the stricture is often the best treatment. Such a case is reported by H. L. Attwater.²

Jeanbrau and Truc³ report two cases of very serious urethral hæmorrhage after internal urethrotomy for stricture on the same day. The cause lay in a blade too finely sharpened. After sharpening the blade of the urethrotome it should be nickel-plated or gilded, in order to be slightly blunted.

In cases of acute retention due to stricture of the urethra a fine gum-elastic bougie can often be passed, if necessary by the faggot method³ (Fig. 55). This

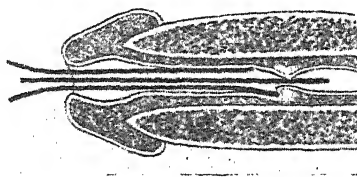


Fig. 55.—The faggot method of passing bougies.

answers the purpose admirably, for urine trickles slowly alongside the instrument, and lo! our very objective, namely slow decompression of the bladder, is accomplished.

Urethral Diverticulum.—A. V. Adler-Racz⁴ met with two cases of large diverticula of the urethra which presented clinically as peri-urethral abscesses. In one case the patient was a boy of 3, in the second the patient was a middle-aged man. Urethrography was of great aid in making the diagnosis.

J. W. Thomson⁵ describes a case of a patient aged 55 admitted with extravasation of urine. When the perineum was incised a stone $2\frac{1}{2}$ in. by $1\frac{1}{2}$ in. was found in a diverticulum of the urethra. There was no stricture. After drainage had been effected and the infection had abated, the diverticulum was excised.

H. H. Morton⁶ has made a study of Morgagni's crypts of the urethra. He presents evidence to show that these crypts are not blind pockets, but are the ducts of Littre's mucus-secreting glands.

Rupture of the Urethra.—There are two varieties of rupture of the urethra :—

1. *Rupture of the Bulbous Urethra.*—The triad of signs in this accident are : (a) Urethral hæmorrhage ; (b) A perineal hæmatoma ; (c) Retention of urine.

2. *Intrapelvic Rupture of the Urethra.*—This is an even more serious condition than the foregoing. The mortality is higher and the immediate diagnosis more difficult. The lesion is almost always an accompaniment of a fractured pelvis. The urethra is ruptured at the apex of the prostate.

If the urethra has been ruptured, it is of paramount importance to know if the rupture is complete or incomplete. By ordinary physical examination it is impossible to obtain this information. The practice of attempting to pass a catheter with only ordinary precautions and the infection of ulcerated tissues which ensues thereby accounts for a large number of traumatic strictures. Soundings should only be carried out in the operating theatre, where asepsis

can be assured and operative measures be undertaken immediately in necessary cases.

If urgent relief of retention of urine is needed before these facilities are at hand, such as may be the case in remote districts or at sea, catheterization is still contra-indicated. The bladder should be emptied by suprapubic aspiration. The catheter can be withheld even in the direst emergency and under the most extenuating circumstances, as is shown by a case of what proved eventually to be a complete rupture of the urethra, occurring on board ship four days out from Havre. Catheterization was not attempted, retention being relieved by repeated suprapubic punctures until the ship reached port, when the patient was transferred to hospital. Extravasation did not occur.

Benign Tumours of the Urethra.—The usual benign tumours of the urethra are papillomata and angiomata. A history of chronic urethritis nearly always accompanies these neoplasms. Hæmaturia occurs after instrumentation, or, in long-standing cases where the tumour has undergone ulcerative changes, bleeding occurs spontaneously. This is specially true of angiomata. Benign tumours are often situated near the first inch of the urethra. As the tumour enlarges it causes increasing difficulty and forking of the stream. The best treatment consists in *fulguration*, carried out directly when the tumour is situated close to the meatus, or through a urethroscope when it is further back. (J. A. Lazarus⁷.)

Carcinoma of the Urethra.—The sites for primary urethral carcinoma are the same as those of urethral stricture (A. Glingar⁸).

J. A. Lazarus⁹ says that it is a squamous-celled carcinoma which is usually encountered; papillary carcinoma occurs less frequently, while the columnar-celled tumour is rare. A history of a stricture is obtainable in over 50 per cent of cases. The symptoms are those which characterize a stricture of the urethra. As the tumour progresses, the penis becomes thickened and indurated, and at times it assumes a state of complete and painful priapism. A not unusual concomitant finding is a periurethral abscess, and the abscess often disguises the underlying pathology. Hæmorrhagic urethral discharge is a common complaint. Pain in the penis may be severe, but it is sometimes lacking entirely. Suspicion should be aroused when a stricture fails to respond to urethral dilatation and instrumentation causes bleeding easily. The treatment of choice is early and radical amputation of the penis with block dissection of the lymphatic nodes of both groins and crural canals. Radiotherapy should be part of the after-treatment. The prognosis of urethral carcinoma is generally poor, since it usually remains unrecognized for a considerable time.

Hypospadias.—There are many plastic operations for the correction of hypospadias, but there appears to be none so uniformly satisfactory as Ombredanne's pouch operation, which is described and illustrated by H. H. M. Lyle.¹⁰

The age of election for an operation to correct hypospadias is between the sixth and seventh years (Pettinari¹¹).

Urinary Incontinence.—C. R. Bard & Co., of New York, have made a penile clamp for patients suffering from minor degrees of incontinence of urine (Fig. 56).

The Female Urethra.—For indefinite pain referred to the vicinity of the pelvis when no obvious lesion can be detected, A. I. Folsom and J. Alexander¹² emphasize the need of carefully investigating the urethra as the source.

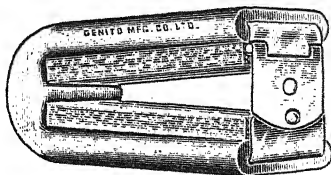


Fig. 56.—A clamp for incontinence. It consists of a non-rustable, malleable metal frame and sponge-rubber cushion pads.

Urethral Caruncle.—J. L. Crenshaw¹³ gives the following instructions for the removal of a urethral caruncle. The method has been practised for many years at the Mayo Clinic, with highly satisfactory results. After the parts have been cleansed thoroughly a swab saturated with 10 per cent of cocaine and lubricated with a soluble lubricant is inserted into the urethra and left for ten minutes. The base of the caruncle is seized with a clamp and the growth is cut off close to the upper surface of the clamp. With the clamp still in position the cut surface is seared with liquor hydrargyri nitratis (U.S.P.), care being exercised to prevent excess of the acid running over the blades of the clamp, which is then removed. No bleeding occurs and the symptoms are relieved almost immediately.

Carcinoma.—O. Mercier¹⁴ treated a case of squamous-celled carcinoma of the urethra in a female with radium. The patient has remained cured for three years.

REFERENCES.—¹*Minor Surgery of the Urinary Tract*, 1932; ²*Lancet*, 1933, ii, 1424; ³*Soc. franç. d'Urol. du Sud-Est*, 1933, Dec. 3; ⁴*Zeits. f. urol. Chir.*, 1933, Nov., 165; ⁵*Brit. Med. Jour.*, 1933, Aug. 26; ⁶*Urol. and Cutan. Rev.*, 1933, xxxvii, 293; ⁷*Ibid.*, 604; ⁸*Zeits. f. urol. Chir.*, 1933, Nov., 165; ⁹*Jour. Urol.*, 1934, June, 823; ¹⁰*Ann. of Surg.*, 1933, Oct., 513; ¹¹*Arch. ital. di Urol.*, 1933, Oct., 556; ¹²*Jour. of Urol.*, 1934, May, 731; ¹³*Bumpus's Minor Surgery of the Urinary Tract*, 1932; ¹⁴*Jour. de l'Hôtel Dieu de Montreal*, 1933, June, 241.

URINARY TRACT SURGERY IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

Obstruction of the ureters by an aberrant vessel or fibrous band has been repeatedly recognized in adults, but there are few references to the parallel condition as it affects children, and the opinion has been expressed that it is only in adult age or adolescence that the degree of secondary pathology is such as to make the recognition of the error possible. M. F. Campbell¹ has dispelled this illusion. He has published records of seven proved cases and one probable case in which ureteral obstruction arose from the existence of aberrant vessels (*Fig. 57*). The ages ranged from 10 months to 12 years. The clinical features were aching pain in the loin, sometimes relieved by pressure or position, frequency and pain on micturition, pyuria, and occasional hæmaturia.

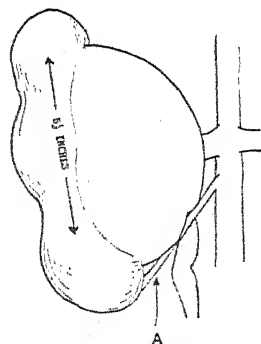


Fig. 57.—Schema of vascular ureteral blockage in Dr. Campbell's Case 1. A similar finding was observed at autopsy in another case. A, Aberrant polar artery. (Reproduced by kind permission from the 'American Journal of Surgery'.)

Campbell is doubtful as to the exact steps of the pathological sequence, but he believes that ptosis of the kidney, in so far as it may lead to angulation of the ureters over the aberrant vessel, is the significant and culminating factor in the series of events. From this point the hydronephrosis is liable to increasing degrees of obstruction, so that infection is acquired and established. The seriousness of the error is exaggerated by the fact that a nephritis of a toxic type develops in the unobstructed kidney, and thereby the whole general health may be imperilled. The author makes a strong plea for the careful investigation of all cases of pyuria in children, and draws attention to the persistent presence of pus in the urine which led to the recognition of the true state of affairs in the cases under review.

With regard to treatment, operative interference of some kind is always

demanded. Severance of the vessel seems to be the most reasonable and certainly the easiest course to adopt, but Campbell points out that in certain instances such a course may imperil the blood-supply of a section of the kidney. If there is a risk of this occurring, some type of ureteroplasty may have to be considered. In fully established cases where hydronephrosis has resulted in tissue destruction, or where there is much infection or calculus formation, nephrectomy is required.

The article has value because it emphasizes the great importance and necessity of employing modern urological methods in the diagnosis and treatment of persistent urinary tract infection in young patients.

REFERENCE.—*Amer. Jour. Surg.* 1933, Dec., 527.

UTERUS, PROLAPSE OF. *Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.*

In most industrial centres and, we venture to think, in many agricultural areas also, descent of the genital tract in part or in whole is one of the commonest conditions for which women seek advice. The lesion has long been attributed to injury of the pelvic floor sustained during labour, and the actual supporting structures involved are now recognized as being the strong bundles of muscular and connective tissue which stretch across the pelvis at the base of the broad and utero-sacral ligaments.

Although there is no doubt that prolonged stretching or tearing of these uterine supports results in uterine descent, we have for some time been impressed with the fact that, quite apart from trauma, a fundamental general factor must exist which is the deciding point as to whether or not in a given case prolapse will develop. Most practitioners are familiar with the 6-para or over who presents no evidence of any displacement of the pelvic floor in spite of the fact that all the alleged predisposing and causative factors have been active. They are also familiar with the primipara who, after sometimes a normal and easy labour, presents herself at a later period with symptoms of relaxation of the pelvic supports, involving either bladder or uterus. Cases are also by no means unknown of the development of *cystocele*, *descent of the vaginal vault*, and even *rectocele in nulliparae*. In the space of twelve months we have encountered examples of all three varieties in nulliparae in the course of ordinary hospital practice and not necessarily in industrial workers.

Such observations impel the suggestion that the prime etiological factor in the development of prolapse resides in a *developmental or constitutional weakness* of the normal supporting structures. The woman who is likely to develop descent of the pelvic viscera is commonly possessed of a large and broad pelvis. Frequently she is of rather obese type, and her muscles generally, and especially in the abdominal wall, lack tone. She is of a 'flabby' type, as contrasted with the spare 'wiry' woman, who, in our experience, rarely suffers from prolapse even after repeated and sometimes difficult labours. Whilst conformation of the pelvis, and corresponding variation in length and development of the supporting ligaments are, in our opinion, important factors in the incidence of displacements, we are also inclined to lay special emphasis upon the muscle content of the ligaments involved. Fatty degeneration of the muscle fibres, and their replacement by fibrous tissue such as occurs during subinvolution and at the time of the climacteric, are, we believe, highly important factors upon which too little emphasis is laid.

A few years ago we instituted an inquiry amongst hospital patients as to the exact period when symptoms associated with prolapse first developed. The majority of the women dated their disability from the first confinement, even though the labour had been uncomplicated and had terminated by natural forces. Subsequent pregnancies, quite apart from actual labour,

had accentuated the trouble, but in many the lesion had not become acute until the approach of the *menopause*. In other words it was a constitutional rather than an acquired factor which finally compelled the patient to seek advice.

In a recent address on the treatment of prolapsus uteri Fletcher Shaw¹ refers to the occurrence of this lesion in virgins, and observes that although there must be some developmental weakness of the pelvic floor, there is generally a secondary cause. He points out that this accounts for the fact that "these cases of prolapse in virgins occur chiefly in the industrial North where a large number of women do heavy work in the mills". We are not in entire agreement with this observation, inasmuch as we have met with not a few instances amongst shop assistants and office workers, as well as members of the leisured classes. We presume that hard milling work is associated with temporary but repeated increase in the intra-abdominal pressure, but it is difficult to understand how such factors operate in the case of sedentary workers and some shop assistants. Given the constitutional defect, whether developmental or acquired, e.g., obesity, lack of exercise, etc., constipation and habitual over-distension of the bladder would appear to be as potent etiological factors as heavy manual labour.

TREATMENT.—Whatever the cause of prolapse may be, the *surgical treatment* of descent of the pelvic viscera in this country is now more or less standardized, mainly as the result of the work of A. Donald,² W. E. Fothergill,³ and subsequent workers of the Manchester school. Simple colporrhaphy, both anterior and posterior, has been supplanted by radical *colpoplasty* involving careful and accurate suture by means of buried catgut ligatures of the deep supporting muscular and ligamental structures of the pelvic floor. The modern '*Manchester operation*', recently again described in detail by Fletcher Shaw,¹ involves not only tightening and strengthening the pelvic floor, but in many cases includes amputation of the cervix. Shaw criticizes very strongly other surgical procedures which in some quarters are still employed for treatment of this condition. *Hysterectomy* as a cure for prolapse is useless, and most gynaecological surgeons will agree with his statement that "the very worst type of prolapse is the one which occurs after hysterectomy has been performed". Should it be necessary to remove the uterus for some coexisting lesion, a vaginal hysterectomy can easily be performed along with the colpoplasty, but the greatest care must be exercised in subsequently suturing together the muscle bundles which were originally inserted into the uterus.

Abdominal fixation of the uterus, although apparently still performed in some centres, is quite useless as a cure for uterine descent. Even if combined with colpoplasty it is very seldom required, and then only in those cases where the tissues of the pelvic floor are so deficient as to be incapable of supporting the uterus. From time to time we meet with cases in which either an abdominal fixation or some operation upon the round ligaments has been performed for the cure of backward displacement of the organ without relief to the patient's symptoms. The majority of such instances in multiparæ relate to women in whom the pelvic floor is weak, and from failure to recognize that the retroversion is but a phase of uterine descent. Such lesions should be dealt with by the '*Manchester operation*' if the patient's symptoms are to be cured.

In some Continental clinics a *vaginal interposition* operation is still favoured in the treatment of prolapse, but its sphere of usefulness is limited in that such a method is incompatible with the possibility of subsequent pregnancy. It is only suitable, therefore, for patients well past the menopause or when combined with an operation for sterilization. Further, L. Fraenkel⁴ has recently stated with reference to vaginal interposition that "a carefully performed operation

for an extensive prolapse requires for its performance ninety or more minutes". As Shaw observes, this cannot compare with a colpoplasty which only takes thirty minutes.

REFERENCES.—¹*Amer. Jour. Obst. and Gynecol.* 1933, xxvi, Nov. 5, 662; ²*Jour. Obst. and Gynecol. Brit. Emp.* 1921, xxviii, 256; ³*Ibid.* 1915, xvi, 29, 1916, xvii, 146, 1921, xxxviii, 251. *Proc. Roy. Soc. Med.* (Sect. Obst. and Gynecol.), 1908, 43; ⁴*Amer. Jour. Obst. and Gynecol.* 1927, xiii, 757.

VACCINATION.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—L. Isaac¹ states that of 1041 babies born in the University Hospital, Iowa, between Jan. 1, 1932, and May 7, 1933, 808 were vaccinated. As the reactions in premature infants proved to be unusually severe, they were subsequently not vaccinated. The proportion of positive reactions during the entire period was 32.2 per cent, being 29 per cent in males and 35.5 per cent in females. Positive reactions had no significant effect upon the gain in weight during the first eight days of life. In most of the positive cases the temperature was not raised, but in a few instances fever up to 102° was present for a few days. The proportion of successful vaccinations seemed to depend largely on the freshness of the vaccine, but positive reactions were more frequently obtained on the thighs than on the arms.

A case of natural cow-pox is reported by J. A. C. Schepel² in a milkman, aged 50, who had been milking cows with diseased udders and was admitted to hospital with the diagnosis of whitlow of the right ring finger and cellulitis of the arm. The finger showed an ulcer with a dark necrotic centre, from which a network of painful, bluish-red lymphatic cords passed up the arm. There was a large mass of inflamed glands in the axilla. The temperature was 104° for a few days, but became normal in ten days. No pus formation took place and no scarring resulted. Four other milkmen of the same farm were similarly affected.

The following information has recently been published by the International Office of Public Health³ relative to the incidence of *post-vaccinal encephalitis* in various countries. In England four cases with one death were notified between April, 1932, and May, 1933. Since then four more cases with no deaths have been reported to the Ministry of Health. In Holland five cases with two deaths were notified in 1933, but as neither of the fatal cases was examined by a neurologist the diagnosis was not absolutely certain. The annual number of vaccinations in Holland, which formerly was as high as 150,000, has of recent years considerably diminished, being only 30,000 in 1932 and 25,000 in 1933, so that the proportion of encephalitis is about 1 for every 5000 vaccinations, as it was in previous years (see MEDICAL ANNUAL, 1930, p. 549). In Sweden, where 36 cases with 8 deaths were notified between 1924 and 1933, the proportion of cases is about 1 to every 20,000 vaccinations. In Germany 14 cases were reported among primary vaccinations with 1 death, and 5 cases with 2 deaths among revaccinations in 1933. Every case notified was examined by a committee of specialists. During the period 1927 to 1933 there were 134 cases with 39 deaths among a total of about 14,000,000 vaccinations or revaccinations in Germany.

A case of *anaemia* which developed a fortnight after successful vaccination is reported by R. Canino⁴ in a male infant, aged 18 months. The red cells numbered 3,100,000 and the leucocytes 6500, the hæmoglobin was 65 per cent. Differential count: polymorphonuclears 35 per cent, lymphocytes 50 per cent, monocytes 7 per cent, transitionals 5 per cent, plasma cells 0.2 per cent, metabasophils 1.3 per cent, lymphoblasts 1.4 per cent, and Rieder's cells 0.9 per cent. The cervical submaxillary, axillary, and inguinal glands were

enlarged. Under treatment by iodine and arsenic the glands subsided in a little more than a month, and the blood became normal in two months' time.

TREATMENT.—E. Barla-Szabo² employed irradiation by X rays in 37 recently vaccinated children, who with the exception of one aged 7 years were between the ages of 4 and 12 months. The applications were made during the stage of formation of the areola. Except in very severe reactions, when it was repeated on two successive days, only one application was made. The result as confirmed by observations on controls was a rapid subsidence of the reaction and constitutional disturbance without interference with the securing of complete immunity. The method is indicated in abnormally severe reactions, for sensitive children, and for cases where intercurrent diseases occur during the period of reaction.

REFERENCES.—¹Amer. Jour. Obst. and Gynecol. 1934, xxviii, 580; ²Nederl. Tijds. v. Geneesk. 1934, lxxviii, 1855; ³Bull. Off. internat. d'Hyg. publ. 1934, xxvi, 75; ⁴Pediatrics, 1934, xcii, 631; ⁵Arch. of Kinderheilk. 1933, ci, 1.

VARICELLA. (See CHICKEN-POX.)

VARICELLIFORM' ERUPTION.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

W. H. Brown¹ describes the case of a male infant, 9 months old, who developed infantile facial eczema when 7 months old. After this had persisted for about two months a severe pustular eruption developed on the face and neck (Plate LV). The eruption was strikingly varioliform in character. The individual lesions varied in size from $\frac{1}{8}$ to $\frac{3}{8}$ in. in diameter, were circinate or oval in shape, papulo-pustular, and firm in consistency. The smallest lesions were definitely opalescent and at no time were any varicelliform vesicles seen. As the lesions enlarged they became more markedly pustular, and the fully developed ones became slightly umbilicated on the surface, some forming a dark brownish central crust. The degree of firmness of some of the lesions closely approximated to the shotty character met with in small-pox; this was particularly so in isolated lesions on the hand and foot. The eruption was practically confined to the face, neck, ears, and scalp; there was one discrete papulo-pustule on the left wrist and one on the right ankle. There were a few small lesions on the shoulders, but otherwise the trunk was absolutely free. On the left side of the face the eruption was practically confluent. There was a diffuse marked œdema on the left side of the neck, suggesting an adenitis, but no discrete glands could be detected. The œdema extended over the left side of the face and involved the upper and lower lids of the left eye. The throat was red and congested. The temperature ranged from 102° to 104°, lasted about a week, and then gradually fell, but the child was not toxic, rather bright and alert, and with no constitutional symptoms. The child made a slow and uninterrupted recovery and was discharged from hospital seven weeks later. Staphylococci were alone cultivated from the vesicles. The author at first suspected an iodide eruption, but this was ruled out. In view of the possibility of small-pox the local M.O.H. was consulted, but this disease was excluded as the eruption was much too localized, and the child was not ill enough for small-pox with an eruption of such a degree. The case was seen by Dr. Jenkins Oliver, who had seen a similar case in Professor Rasch's Clinic in Copenhagen which had been diagnosed by him as an example of 'varicelliform dermatitis', described by Kaposi in the 'eighties' of last century. Kaposi met with an epidemic of cases of this type—though the lesions appear to have been more vesicular and less pustular than in the present case—occurring as a complication of infantile eczema and usually ending favourably. Kaposi reported 10 cases of

PLATE IV

'VARICELLIFORM' ERUPTION

(W. H. BROWN)



By kind permission of the 'British Journal of Dermatology and Syphilis'

this eruption, but since that time only three observers have reported cases, and this is the first case described in this country.

Although all the cases previously described have been in infants, A. D. McLachlan,² about the same time, and also in Glasgow, saw a similar case in a young woman of 25 years. This patient had suffered from eczema of the Besnier type since childhood. She was a patient in hospital and had improved so much that she was allowed to leave the hospital for one day. On the evening of her return she complained of severe headache and acute pain in her back, and vomited soon after re-admission; her temperature rose to 101.2°. On the following morning the left side of her face was considerably swollen and a pustular eruption was noted on the left cheek and temple. The swelling rapidly extended to the right side of the face and downwards to the neck, causing almost complete closure of the eyes and some difficulty in swallowing and breathing. The eruption was pustular in type, the pustules being discrete, round or ovoid in contour, and raised in parts about $\frac{1}{4}$ in. above the level of the skin. They appeared with great rapidity and followed the spreading oedematous swelling; they were tense and shotty, and seemed to be deeply embedded in the skin. For the most part their surface was flattened, showing in many a depressed centre amounting to umbilication. In two days the patient was acutely ill, her temperature reaching 103°, and the eruption, preceded by diffuse oedema in the parts affected, had appeared on her neck and about her wrists and elbows. The trunk and lower limbs and the hands and feet were not involved. Her tongue was dry and thickly coated, and her fauces were red and oedematous. The cervical glands were swollen and tender. Culture from the pustules gave a pure growth of *Staphylococcus aureus*. No fresh lesions appeared four days after the onset, and on the fifth day the condition began to subside. Temperature fell by crisis and reached normal on the sixth day. She was well two weeks after the onset. The patient had been vaccinated nine years previously and had taken no bromides or iodides during her stay in hospital.

Both these cases were much more varioliform than varicelliform, but this had been noted by previous observers, Juliusberg labelling the condition 'varioliform' and Galewsky 'vacciniform'; but whatever term is used, the cases all seem to be closely related to those originally described by Kaposi.

REFERENCES.—¹*Brit. Jour. Dermatol. and Syph.* 1934, Jan., 1; ²*Ibid.* 8.

VARICOSE VEINS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

C. Ottley¹ discusses *heredity and varicose veins*. He states that the inheritance of varicose veins appeared to be of a simple dominant type in 26 families investigated.

TREATMENT.—D. H. Patey² states that recently signs have begun to appear that everything is not well with the injection treatment of varicose veins. There appears a high incidence of recurrence. After-care is prolonged, and cases treated by operative procedures of various types have commenced to creep back. In the simple instance of a varicose condition of the internal saphenous system the most successful results can be obtained by a combination of excision and injection. It is best to excise the whole of the main vein in the thigh by means of Babcock's instruments. The operation is simplified by performing first a local excision of about 4 in. of the vein under local anaesthesia. The patient is allowed to return home. At the time of operation an injection is given into the lower end of the exposed vein. The solution used is quinine and urethane in half strength. From 5 to 8 c.c. of this solution are injected at the end of the operation; the leg is bandaged from the instep to above the incision with elastic adhesive strapping which is left undisturbed for ten days. The results are satisfactory. If a few varicose veins still remain they usually

respond to one or two further injections, since the main regurgitant stream has been cut off.

Early varicose veins, such as are seen in a young woman who has noticed a few small varicose veins, respond satisfactorily to pure injection treatment. The late results are good. For dilated skin venules the treatment is unsatisfactory. If there is an obviously communicating subcutaneous varicose vein, injections sometimes do good. Otherwise the possibility of X-ray or radium treatment as for angiomas should be considered.

Varicose veins associated with ulcers are also a problem. Those without ulcers are common, and varicose ulcers with no trace of varicose veins are also frequently seen. The relationship between the two is not clear. If varicose veins are distinct in the presence of ulcer, the former should be treated actively, but retrogression of the ulcer cannot be guaranteed.

Patey concludes that the treatment with surgical methods still occupies an important place and that the best results are obtainable in cases in which both surgical and injection methods can be combined.

W. M. Cooper³ also states that the injection treatment of varicose veins is not the 'cure-all' it promised to be when first presented. There is a large group of patients which cannot be successfully treated by this method unless preliminary ligation or ligations are performed. Radical excision of a varicosed saphena vein is frequently followed by recurrence unless high ligation of the vein is practised. Similarly, in the injection method of treatment recurrence may follow unless high ligation is performed as a preliminary measure.

Cooper attaches considerable importance to the Trendelenburg sign. It may be useful to restate how the Trendelenburg test is employed. When the patient is standing pressure should be applied with the thumb of one hand on the lower end of the saphena vein in the thigh. The blood is then milked upwards and if the vein remains collapsed the valves are competent, i.e., the Trendelenburg sign is absent. If the vein fills from above, the valves are incompetent and the Trendelenburg sign is positive. When the Trendelenburg sign is positive ligation at the highest palpable point in the thigh is definitely indicated; when the sign is negative injections may be commenced as a rule without preliminary ligation. Cooper prefers sodium morrhuate (5 per cent) for injection purposes; the quantity should never exceed 5 c.c. The injections are made while the patient is standing; the needle points upwards. As soon as the solution is injected a tonsil sponge, moistened with alcohol, is placed firmly over the site of the puncture and the needle is withdrawn. The pad is bound firmly in place by adhesive strapping. Injections may be repeated every second day, and in the intervals a spiral elastic bandage is employed. The author states that not a single instance of recurrence was noted in a series of 293 cases of extensive and recurrent varicose veins treated by preliminary ambulatory ligation and subsequent injections; occasionally a radical cure is obtained by the ligation alone.

REFERENCES.—¹*Brit. Med. Jour.* 1934, i, March 24, 528; ²*Practitioner*, 1934, June, 695; ³*Ann. of Surg.* 1934, May, 799.

VARIOLA. (See SMALL-POX.)

VAS DEFERENS. (See TESTIS AND APPENDAGES.)

VENEREAL DISEASES PREVENTION. Col. L. W. Harrison, D.S.O.

L. W. Harrison¹ in a lecture on methods of preventing venereal disease discussed them under the following headings: (1) Efforts to reduce² extra-marital intercourse; (2) Regulation of prostitution; (3) Use of preventives

against contact with infectious secretion during intercourse; (4) Disinfection after exposure; (5) Prophylactic general treatment before exposure; (6) The same after exposure; (7) Treatment of carriers. Regulation of prostitution may succeed under conditions of strict discipline, with an adequate medical staff, but usually fails, and is gradually being abandoned because under it clandestine prostitution is increased, clandestines are deterred from applying for treatment, and medical examination, even when, as rarely happens, it is carried out thoroughly, affords no guarantee against infection. It can succeed if all prostitutes are regarded as diseased and disinfected every day. This is one method of preventing the passage of organisms from women to men; for example, if all women with gonorrhoea could have daily treatment, gonorrhoea would quickly begin to diminish. Another method of the same class is the use of the condom. Disinfection after intercourse is a subject which has aroused fierce controversy. Its most ardent adherents claim that, if local health authorities were to preach its virtues, venereal disease would quickly reach the vanishing point. That this is unlikely is shown by the experience of disciplined communities where it is practised and has the best chance of succeeding. Their records are mostly one long apology for its comparative failure. In the British Army at Home the V.D. incidence is now very low, but this is attributable to the low rate in the civilian community; in stations where the civil community is more highly infected the incidence in the troops is far from the vanishing point. Thus in 1932 the Home rate was 11.2, but in China (amongst a number of stations mentioned) it was 128.9 per 1000 per annum.

Prophylactic chemotherapy has been practised by Sonnenberg in prostitutes by injecting them at regular intervals with bismuth; apparently it was very successful in preventing syphilis. Chemotherapy after exposure by ingestion of stovarsol or by injection by arsenobenzene compounds has apparently been successful in a number of cases, but has the disadvantage that it might only prevent the development of the primary sore, not the infection, and leave the patient in a fool's paradise. Treatment of the carrier is universally acknowledged to be the most effective method. It is the principle of the V.D. Scheme of this country.

REFERENCE.—¹*Lancet*, 1934, i, 1021.

VENTRICULOGRAPHY. (See CEREBRAL PNEUMOGRAPHY.)

VITAMINS.

Ivor J. Davies, M.D., F.R.C.P.

The Significance of Vitamins in Practical Experience.—L. J. Harris¹ (M.R.C. Nutritional Laboratory, Cambridge) opened the discussion on this subject at the Annual Meeting of the British Medical Association in 1933. The prevalence of rickets was described. Statistical data have been collected to show that, under our climatic conditions, unless special prophylactic measures are taken, 'some degree of rickets' supervenes in a large percentage of instances, with an appreciable proportion of 'severe' cases, no common foodstuff containing sufficiently large amounts of the anti-rickets vitamin. Experience shows that the most certain remedy is *irradiated ergosterol*. For curative treatment irradiated ergosterol is undoubtedly the method of choice; it can easily be given at a sufficiently high and precisely standardized level. When administering irradiated ergosterol, however, it is essential to adhere strictly to the correct dose, since overdosage gives rise to hypervitaminosis. Adequate nutrition is not possible for certain sections of the community under existing economic conditions; and much scientific knowledge of nutrition already won fails to receive sufficiently wide recognition or practical application. Harris's

excellent summary of current knowledge of the significance of vitamins should be read in full, together with an earlier article in the same journal² which submits the exact evidence on which his conclusions were based.

Avitaminosis (B. Group).—In a discussion on avitaminosis (B. Group) in tropical and temperate countries, at the Royal Society of Medicine, Harriette Chick³ discussed the results of laboratory work on vitamin-B deficiency in relation to clinical experience and put forward suggestions which may be found worthy of the attention of clinicians working in these fields of disease. Professor R. A. Peters sketched the present position of research upon the chemistry of the vitamin-B complex, directing his remarks mainly to vitamin B₁, and emphasized the main features of animal experiments, including some discussion of the function of the vitamin, of its possible exhibition, and its application. He urged a trial of vitamin B₁ in the following conditions: Loss of appetite; œdema; palpitation and breathlessness, especially when it can be shown that there is defective removal of blood lactic acid after exercise; neuritic conditions; painful muscles. He laid stress on the fact that the symptoms in the B₁ deficiency disease in experimental pigeons were functional and that they reacted within an hour to treatment. At present there is still a high degree of technical chemical skill required to reach the crystalline vitamin, as in the concentrate prepared by Professor Peters at Oxford. Other authoritative opinions were expressed, and the full account deserves careful study.

Vitamin A.—A. F. Hess, J. M. Lewis, and L. H. Barenberg⁴ (New York) made a study to ascertain whether American diet requires vitamin-A supplement: 40 infants were given large amounts of carotene daily, 40 were given large amounts of haliver oil, and 80 no vitamin-A supplement; all likewise received viosterol. In the course of an observational period of five months, frequent respiratory infections developed in all three groups, among those receiving vitamin A to the same extent as among the control group. Pneumonia and otitis media were not prevented. The blood in the carotene cases was saturated with the provitamin, as indicated by marked carotenæmia. There is no clinical basis for considering or designating vitamin A the 'anti-infective vitamin'. The addition of cod-liver oil to the dietary did not reduce the number of mild respiratory infections occurring during the summer months. Infections of the skin, impetigo, developed in the vitamin groups quite as often as in the control group. Inquiry throughout the United States disclosed that night-blindness, the most delicate index of deficiency of vitamin A in the adult, is a very rare disorder and has not increased during the past few years. U.S.A. dietary is not deficient in vitamin A. A lack may come as the result of vagaries of diet or when absorption is defective; for example, in diarrhoea or jaundice.

S. W. Clausen⁵ (Rochester, N.Y.) has studied the limits of the anti-infective value of provitamin A (carotene), and concludes that children over the age of 2 years are likely to receive a diet containing a sufficient amount of vitamin A. Results of analysis of the plasma for carotene suggest that not more than 5 or 10 per cent of recurring respiratory infections can be attributed to a low intake of carotene.

The livers of children at autopsy usually contain considerable amounts of vitamin A; whether or not these quantities are sufficient to protect against infection can be decided only by much more extensive study.

During the period of rapid growth in experimental animals, adequate amounts of vitamin A are needed. If vitamin A is withheld during rapid growth, the tissues are so altered that resistance to infection is low. If vitamin A is present during this period, the organism may subsequently be depleted of its stores of vitamin A without developing a marked loss of resistance to certain

infections. When rapid storage of vitamin A is desired, halibut-liver oil, or cod-liver oil, would seem more suitable than preparations of carotene, because of the more rapid absorption of vitamin A than of carotene. Carotene is poorly absorbed in the presence of fever or diarrhoea. It is possible that a large intake of carotene is undesirable. In ordinary circumstances, sufficient quantities of vitamin A are provided by a diet in infancy which contains milk, cod-liver oil from the second week of life, and vegetables from the fifth or sixth month.

Hunger Osteopathy; Juvenile and Late Rickets.—A. M. Crawford and D. P. Cuthbertson⁶ (Glasgow) describe the clinical and metabolic findings in a case of hunger osteopathy, two cases of juvenile rickets, one case of chondrodystrophy associated with rickets, and a case of late rickets (osteomalacia). The essential difference between the metabolism of the case of hunger osteopathy and the rachitic conditions lay in the fact that the former rapidly stored calcium, phosphorus, and magnesium without the addition of irradiated ergosterol, increased intake of mineral matter leading to increased retention; while, on the other hand, the rachitic cases only showed a noteworthy retention of mineral matter when irradiated ergosterol was added to the diets. It is considered that hunger osteopathy and late rickets (osteomalacia) are not necessarily identical in their nutritional origin, but that late rickets (osteomalacia) is a form of hunger osteopathy—namely, that due to deficient vitamin D.

REFERENCES.—¹*Brit. Med. Jour.* 1933, ii, 367; ²*Ibid.* 231; ³*Proc. Royal Soc. Med.* 1934, Feb., 473; ⁴*Jour. Amer. Med. Assoc.* 1933, ci, Aug. 26, 657; ⁵*Ibid.* Oct. 28, 1384; ⁶*Quart. Jour. Med.* 1934, Jan., 87.

VITILIGO.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

The treatment of vitiligo (leuko-melanoderma) has long been found unsatisfactory. Various methods have been tried with little success, and patients have usually been advised to hide the disfiguring white patches by staining the skin with various preparations. Recently it has been found that in certain individuals, when the skin is dabbed with perfumes containing *bergamot oil* and has subsequently been exposed to strong light, brownish patches have developed on the sites to which the perfume has been applied. This has been described in previous numbers of the MEDICAL ANNUAL under the name of Berlock dermatitis. Certain observers have thought that this form of pigmentation might be produced in patients suffering from vitiligo, and some successful results have been claimed, but in other cases only failures resulted. It is probable that this pigmentation only occurs in sensitized individuals and therefore cannot have universal application. Lindsay, in 1929, recommended injection of *gold sodium thiosulphate* in cases of vitiligo, and claimed some success with this treatment. M. H. Cohen¹ has used a combination of these two treatments in a woman of 19 years. He applied a 10 per cent alcoholic solution of bergamot oil twice daily to the affected areas and exposed the patches to the carbon arc lamp for from three to five minutes twice weekly. At the same time 0.1 gm. gold sodium thiosulphate was given weekly. Within two weeks the condition began to improve and in six weeks the affected areas on the face had completely gone.

N. Burgess² has used Cohen's method on a girl of 13 years, substituting the water-cooled mercury vapour lamp for the arc, and using sanocrysin in 0.05 gm. doses. In this case pigmentation commenced in three weeks and a cure resulted in ten weeks. The condition had not recurred nearly a year afterwards.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1933, Aug., 215; ²*Brit. Jour. Dermatol. and Syph.* 1934, July, 313.

VULVOVAGINITIS IN CHILDREN. *Reginald Miller, M.D., F.R.C.P.*

C. P. Lapage¹ contributes a short note on this condition to emphasize his happy experience with the form of treatment brought forward by G. C. Schauffler.² He points out that a chronic vulvovaginal discharge is a common cause of distress in young girls under 14 years of age. Often, but not always, a swab shows the primary infecting micro-organism, but in some instances the discharge appears to be merely one of the catarrhal states of the mucous membrane in a debilitated child, and swabs show a mixed infection. The form most to be dreaded is, of course, that due to the gonococcus, and fortunately its comparative rarity does something to rob it of the horror that its severity, extreme contagiousness, and its clinical and medico-legal complications might well inspire.

The treatment advocated by G. C. Schauffler consists of the application of a 1 per cent *silver nitrate ointment* made up with anhydrous wool fat. A small metal collapsible tube is filled with the ointment and a piece of rubber tubing is attached to the nozzle of the tube. The rubber tubing is passed into the vagina and the ointment is injected through the tube by compression of the metal tube. Lapage finds the treatment to be painless and free of any tendency to cause after-effects or irritation. He recommends that the treatment should be given daily for a week and then every other day or twice a week. In his series of nine cases, including gonococcal infections, the results were uniformly good and rapidly obtained.

REFERENCES.—¹*Lancet*, 1934, i, 897; ²*Amer. Jour. Dis. Childh.* 1932, xliii, 350.

WEIL'S DISEASE. (See JAUNDICE, INFECTIVE.)**WHOOPIING-COUGH.***J. D. Rolleston, M.D., F.R.C.P.*

SYMPTOMS AND COMPLICATIONS.—In a paper on *whooping-cough in old age*, A. J. Hall,¹ who reports two cases in a man aged 72 and a woman aged 73, states that the possibility of whooping-cough should be considered in every case of severe paroxysmal cough in an elderly person for which there is no obvious organic cause. He deprecates the popular view that old persons may safely mix with cases of whooping-cough whether they have had it or not in childhood. Unrecognized pertussis in an elderly person may be a serious source of infection for children. The attack in old age is usually very distressing, and though not often directly fatal, may be so or accelerate death from other causes.

J. B. Ellison² records his observations on 70 cases of *convulsions* in pertussis, of which 46 were fatal and 24 made a rapid and complete recovery. He considers that the meningo-encephalitic and angiospastic theories deserve most attention and rejects those of spasmophilia and neurotoxin. He holds that there are strong epidemiological reasons for believing that many cases of pertussis eclampsia are due to the combination of whooping-cough and influenza, without its being necessary to assume a definite encephalitis. It is possible that the sympathetic system, already rendered unstable by pertussis, is still further deranged by the virus of influenza so that cerebral vascular crises ensue.

According to S. D. Lazarus and G. Devine,³ who record 18 cases in patients aged from 19 months to 40 years, *blindness* is an exceedingly rare complication and is seldom permanent. It occurs between the first week and fourth month of the disease, and may last from a few minutes to nine months. There are no pathognomonic ocular lesions. At least 50 per cent of the cases show other cerebral manifestations. In most of the cases the ocular changes appear to be due to cerebral oedema or to an acute toxic hæmorrhagic encephalitis.

G. Genoese⁴ maintains that *aural complications* are common in the form of otalgia, otorrhœa, and otitis media, and give rise to intense pain, fever,

malaise, and even alarming symptoms such as extreme restlessness, meningeal reactions, and convulsions. He recommends therefore that a routine examination should be made by an otologist in all cases of whooping-cough, especially when adenoids are present.

J. M. Frawley⁵ reports the first case on record of *rupture of the gastrocolic omentum* in whooping-cough. The patient was a girl, aged 2 years, who developed a tympanitic swelling in the left upper quadrant of the abdomen in the third week of a severe attack of whooping-cough. X-ray examination showed that barium sulphate was retained indefinitely in the stomach. Four days after the onset exploratory laparotomy was performed, when the stomach was found to be dilated and flaccid with a constricting band formed by a rupture in the great omentum extending in the longitudinal axis of the body from the lesser to the greater curvature of the stomach. Hernia of the stomach had taken place through the opening thus formed. The hernia was reduced and the opening sewn up. As there was some thickening of the pylorus, an incision was made in the peritoneal and muscular coats. In spite of the operation the stomach still failed to empty. The paroxysms of coughing continued, and death took place after a convulsion twenty-four hours after the operation.

In a paper on *whooping-cough and tuberculosis* E. Gabriel⁶ states that of 1636 children who had been discharged from hospital after whooping-cough during the period Oct. 1, 1923, and September, 1926, 915 had made a complete recovery, while in 721 recovery was not complete. In 491 of the latter definite information was obtained to the following effect: 26 had died, but in only 7 was death due to tuberculosis. Moreover, continued observation of children who had shown any signs of tuberculosis in hospital did not reveal any evidence of aggravation or extension of the disease, even in those who had had repeated attacks. Gabriel therefore agrees with Pospischill that an attack of whooping-cough hardly ever aggravates pre-existing tuberculosis or rouses into activity a hitherto dormant disease.

D. Moritz and L. Lackner⁷ studied the *blood* in 65 cases of whooping-cough in children aged from 2½ months to 15 years, with the following results. The blood-picture in whooping-cough is characterized by lymphocytosis with an absolute or relative retardation of the sedimentation rate of the red corpuscles. Lymphocytosis exceeding 10,000 with an absolute or relative retardation rate favours the diagnosis of whooping-cough, but the absence of this change does not exclude it. The complications of whooping-cough produce a moderate shift to the left in the Armeth scheme and cause an acceleration of the sedimentation rate.

DIAGNOSIS.—F. Auxilia⁸ refers to Fanton, who invariably found a hæmoclasic crisis in the form of leucopenia following injection of pertussis vaccine in cases of whooping-cough, and therefore regarded it as of great diagnostic value. Auxilia, on the other hand, found the reaction positive in only 13 out of 36 cases of whooping-cough, and in only 2 cases was it positive in the catarrhal stage. He concludes therefore that the reaction is of no value in the diagnosis of whooping-cough.

PROPHYLAXIS.—According to T. Madsen⁹ the vaccine prepared in the State Serum Institute at Copenhagen is always made from several fresh strains of Bordet-Gengou bacilli, and is given in intramuscular or subcutaneous injections with intervals of three or four days between the doses, which consist of 0·5, 0·7, and 1 c.c. respectively, 10,000,000,000 bacilli being contained in each cubic centimetre. Comparative observations in the Faroe Islands in 1923-4 on 2094 vaccinated and 627 unvaccinated persons showed that, while the majority of both groups contracted the disease, only 5 of the vaccinated persons died as

compared with 18 of the unvaccinated, and the course of the disease was much more severe in the unvaccinated. In another epidemic in the Faroe Islands in 1929 the prophylactic value of the vaccine was much greater than on the previous occasion, as 458 of the 1832 vaccinated escaped an attack, while only 8 of the 446 unvaccinated did not become infected. Moreover, only 1 death occurred among the vaccinated persons as compared with 8 deaths among the controls.

TREATMENT.—J. Epstein¹⁰ treated 43 cases of whooping-cough, aged from 2 weeks to 8 years, by *gold tribromide*, a watery solution of which was given by mouth in doses varying with the age of the child and the severity of the attack from $\frac{1}{2}$ to $\frac{1}{10}$ gr. three times a day after meals and once at night. The results were as follows: in about two-thirds of the cases the cough subsided in three weeks, and in the others in from five to seven weeks. In all cases after three to four days' treatment the cough became less frequent and distressing and the attacks shorter and milder, the vomiting ceased, and sleep became more restful. There were no recurrences, no complications, and no deaths. In 25 controls who were given the ordinary remedies the cough was frequent and racking, and the course of the disease ranged from three to four months.

REFERENCES.—¹*Clinical Jour.* 1933, lxii, 397; ²*Lancet*, 1934, i, 227; ³*Amer. Jour. Dis. Child.* 1934, xlvii, 1310; ⁴*Pediatrics*, 1934, xlii, 44; ⁵*Amer. Jour. Dis. Child.* 1933, xvi, 346; ⁶*Jahrb. f. Kinderheilk.* 1934, cxlii, 281; ⁷*Arch. de Méd. des Enf.* 1933, xxxvi, 6⁰⁰; ⁸*Pediatrics*, 1934, xlii, 393; ⁹*Jour. Amer. Med. Assoc.* 1933, ci, 187; ¹⁰*Jour. of Pediat.* 1933, iii, 635.

X-RAY CARCINOMA AND X-RAY DERMATITIS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Sampson Handley¹ states that the general policy adopted in the management of these cases has been the piecemeal removal of obviously malignant lesions. In every case in his experience such a plan had been disastrous. He holds that if a suspicious warty area locally excised is found to be a carcinoma, safety demands a complete gland dissection. The object of the operation is to cut the main line of dissemination at an early stage. The first gland to be invaded is the supratrochlear gland, which lies in the internal intramuscular septum an inch or two above the medial epicondyle. A simple axillary dissection will not meet the case. Sampson Handley describes not only removal of this gland but the trunk lymphatics which connect it with the axillary glands. A negative report from the pathologists gives no firm assurance of the absence of carcinoma infection from the gland.

REFERENCE.—¹*Lancet*, 1934, i, Jan. 20, 1920.

X-RAY DIAGNOSIS.

James F. Brailsford, M.D., M.R.C.S.

CINERADIOGRAPHY.

The development of this branch of radiology has been considerably advanced during the past few years, notably by J. R. Reynolds¹ in this country, and R. Janker in Bonn. The former has demonstrated that rapid serial exposures can be made on a short length of film which will illustrate certain phases of the movement or peristalsis of individual viscera. The length of the film is joined into a circular strip so that it can be repeatedly projected, enabling the observer to concentrate on the movement of particular sections. A photograph of the apparatus used by him is shown in *Plate LVI*. Much still remains to be done before the method is perfected, but when this is completed examination of such a projected film will be of inestimable value for the investigation of visceral

function in health and disease. More recently Reynolds has produced a simultaneous electrocardiograph and cinema film of the heart's movements which should enhance the value of this method of investigation.

POSTURE IN RADIODIAGNOSIS.

It is not generally understood how important a factor posture is for the demonstration of certain structures and how essential it is that the person who attempts to interpret the film shall appreciate the posture assumed by the patient during the exposure. It was because of ignorance of these factors that during the war the positions of so many foreign bodies were wrongly judged and sought for in vain. No matter how obvious the anatomical position may appear to the observer of the radiograph, if he fails to grasp the significance of the position of the part relative to the X-ray tube and the sensitive film, his judgement is likely to be very seriously at fault. For instance, in a radiograph of the skull a foreign body, accurately localized and reported by the radiologist to be lying against the inner side of the coronoid process of the mandible, was wrongly interpreted as lying against the condyle, because the radiograph showed the shadow of the opposite condyle on a plane with the foreign body. An extensive mutilating operation was consequently performed without securing the foreign body, and subsequent radiographs showed that it had not been disturbed.

Multiple instances of errors due to this cause could be given in all branches of diagnostic radiography. The significance of posture in the radiography and interpretation of the subsequent radiographs of the skull have been described and illustrated very well by E. W. Twining,² and at the same discussion J. V. Sparks and J. B. Bush contributed very useful points on the chest and abdomen respectively.

THE SKULL.

Foreign Bodies in the Eye.—An ingenious X-ray apparatus has been devised by A. Howard Pirie³ for examination of the eye for the presence of foreign bodies. With this apparatus he claims: (1) That a patient with a foreign body in his eye can see his own foreign body and locate it in two dimensions and with moderate accuracy in the third dimension; (2) That damage to the retina caused by a foreign body can be located by the patient; (3) That the condition of the retina can be ascertained in a case of complete cataract; (4) That the field of vision can be mapped out by the patient and minute scotomata can be localized at once; (5) That a foreign body lying lateral to the retina can be made to cast its shadow on the near side and on the far side of the retina and thus the patient can be made to see shadows, proving that the foreign body is outside the globe; (6) That letters can be read and pictures and diagrams seen with closed eyes.

Cerebral Radiography.—The method referred to in previous MEDICAL ANNUALS of ventriculography devised by Dandy, encephalography devised by Bickel, arteriography devised by Moniz, have been proved to be of value in the localization of those cerebral tumours which do not present local signs either on clinical examination or on the straight radiograph. These methods have been supplemented by a further device: A. Radovici and O. Meller⁴ have demonstrated the subarachnoid space and ventricular system by injection of 10 to 12 c.c. of thorotrast at the body temperature into the suboccipital space. They claim that the outline of the convolutions and the ventricles is more clearly defined, and that there is little or no reaction. (See also CEREBRAL PNEUMOGRAPHY.)

THE ABDOMEN.

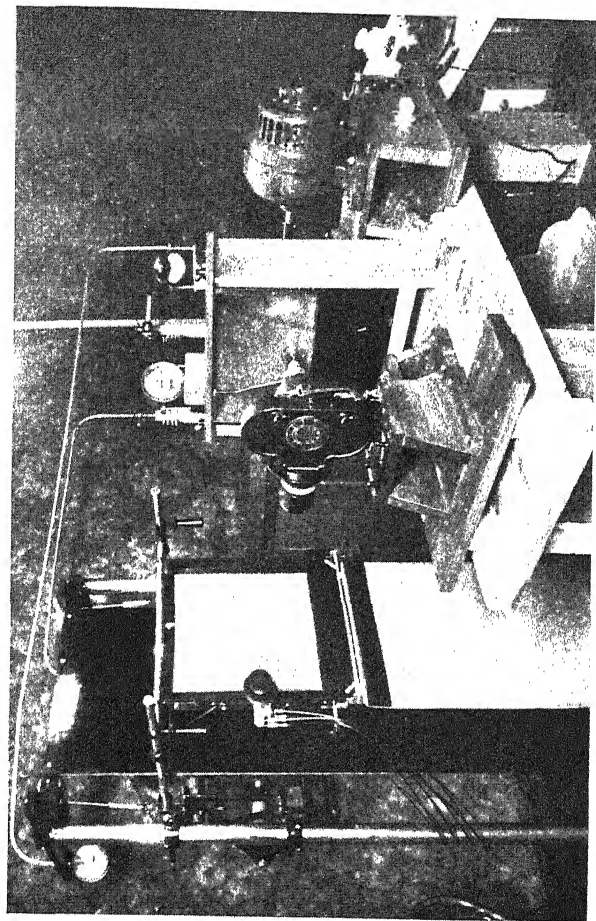
Acute Post-operative Obstruction of the Bowels.—The value of the flat radiograph in the diagnosis of this condition is not appreciated as it should be. The condition arises as the result of adhesions following operative measures involving the peritoneum, and should be discovered at the earliest hour if the patient is to be given the best chance of recovery. Each hour's delay in the diagnosis diminishes the patient's chance of recovery, and unfortunately the lesion cannot be recognized or localized clinically until the life of the patient is seriously jeopardized. In a few minutes, with a minimum disturbance of the patient, by the use of a portable X-ray apparatus it is possible to take a straight radiograph of the abdomen which will show the site of obstruction several hours or even one or two days before the diagnosis can be made by clinical examination. D. W. Palmer⁵ discusses the radiographic findings in these cases. He regards the finding of gas in the small bowel in a quantity larger than the occasional bubbles as abnormal, and the gaseous distension of one loop as the earliest X-ray sign. The ladder pattern described by Treves, though infrequently seen clinically, may readily be demonstrated by the radiograph. It is to be hoped that the method will receive a wider and more extensive application.

Spontaneous Pneumoperitoneum.—Further use of portable X-ray apparatus could advisedly be made in cases of acute abdomen. By means of a straight radiograph it is possible to demonstrate in a few minutes not only the presence and site of obstruction in the intestine but the presence of free gas in the peritoneum. An example of the type of case to which the writer refers is illustrated in *Plate LVII*. This patient, a woman of 32 years, had been in good health until five weeks before she was brought to hospital. During these five weeks she had complained of hypogastric pain, loss of weight and appetite, and during the last three or four days, for the first time, of 'confinement' of the bowels. On examination the abdomen was found to be tensely distended, and free fluid was suspected. No X-ray examination was made. At operation a large papillomatous ovarian cyst was found, with about 1½ gallons of dark fluid within the peritoneal cavity. These were removed satisfactorily, but the patient continued to lose ground during the next week and post-operative pneumonia was suspected. An X-ray examination was now requested and the radiograph shown in *Plate LVII* was taken. It showed that the lung fields were normal but that a large collection of free gas was present in the peritoneal cavity. The patient died a few hours after, and at post-mortem a carcinoma of the sigmoid colon was found associated with stercoral ulceration and perforation of the cæcum. The pedicle of the ovary had healed and there was no evidence of growth in the neighbourhood. A radiographic examination before the operation would have indicated the nature of the lesion producing the symptoms.

In a paper on the value of radiology in the diagnosis of perforated peptic ulcer, R. T. Vaughan and H. A. Singer⁶ state that an examination of their statistics reveals that spontaneous pneumoperitoneum can be detected radiographically in approximately 85 per cent of patients with perforated peptic ulcer. In a series of 97 cases diagnosed as ruptured ulcer which were observed during 1929-31, free air was demonstrated in 70 per cent of the patients examined. The X-ray examination entails no loss of valuable time and does not subject the patient to any additional handling.

Use of Barium Enema.—The barium enema affords the best evidence for the differentiation of diverticulitis and carcinoma of the colon when the examination is thoroughly and efficiently performed (*Plates LVIII, LIX*). It

PLATE III
CINERADIOGRAPHY
(J. R. REYNOLDS)



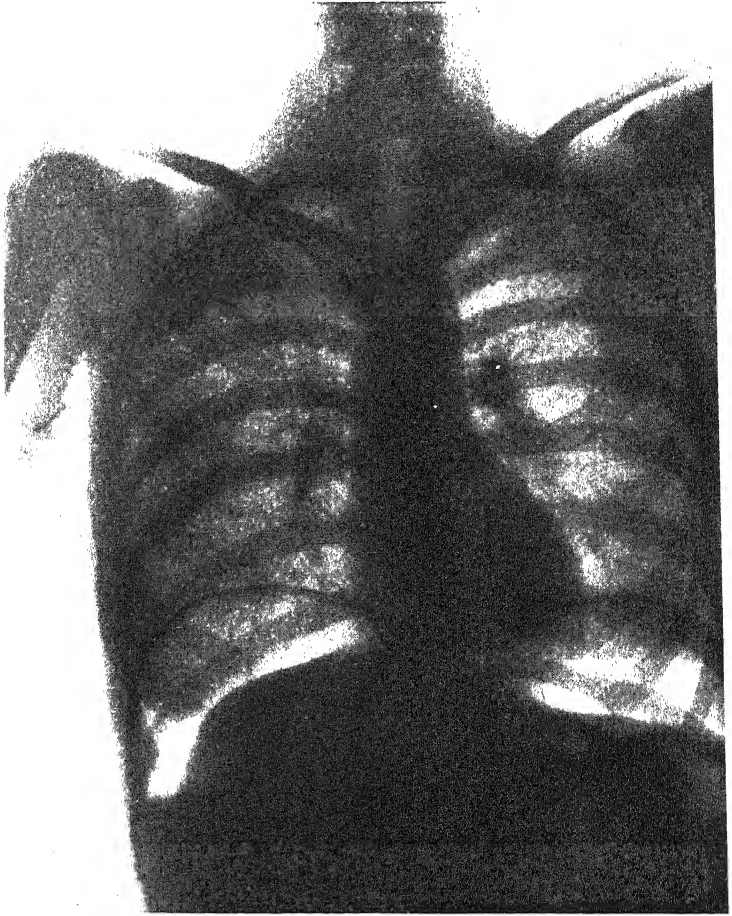
Lay-out of cineradiographic apparatus devised and used by Dr. J. Russell Reynolds.

By kind permission of 'Surgery, Gynecology and Obstetrics'

PLATE LVII

PNEUMOPERITONEUM

(JAMES F. BRAILSFORD)



Pneumoperitoneum. The diaphragm on each side is shown as a regular curved dark thin line with its convexity bounding the lower lung fields. On the right side below this the crescentic light area denotes a collection of gas between the lower surface of the diaphragm and the convex upper border of the opaque liver. On the left side a similar collection of gas is shown below the diaphragm.

PLATE LVIII

DIVERTICULITIS OF THE COLON

(JAMES F. BRAILSFORD)



Diverticulitis of the sigmoid colon causing almost complete obstruction. The colon was filled by a barium meal; the rectum, which is somewhat ballooned, by a barium enema.

PLATE LIX

CARCINOMA OF THE COLON

(JAMES F. BRAILSFORD)



Carcinoma of the sigmoid colon. Note the marked filling defect of the sigmoid colon and dilatation of the descending colon, but no ballooning of the rectum.

should be preceded by a preliminary radiographic examination and followed by a further exposure after the enema has been evacuated. The latter exposure may reveal small lesions which were obscured by the distension of the colon by barium.

H. Shay and J. G. Cohen⁷ claim that by using a double contrast enema small lesions can be detected which might escape detection with other methods. They introduce barium emulsion and air into the colon, and in this way the walls of the air-distended colon are outlined by a thin layer of barium emulsion which enables the small lesion to be detected.

Chronic Hypertrophic Stenosis of the Pylorus in Adults.—Though hypertrophic stenosis of the pylorus in infants is relatively frequent it is rare for this lesion to be seen in adults. Kirklin and Harris⁸ note that the most obvious manifestation of uncomplicated hypertrophy of the pyloric muscle in adults is elongation of the pyloric canal and a crescentic indentation of the base of the first part of the duodenum. The canal may be eccentric in relation to the duodenal cap and hyperperistalsis may be observed. No mass can be felt when the defectively filled area is palpated. The lesion is important in that it may be mistaken for carcinoma, chronic ulcer, or syphilis.

E. W. Twining⁹ has given an excellent description of three cases which he has observed. He believes that minor forms of chronic hypertrophy associated with organic disease of the stomach or reflex activities from other abdominal conditions, and pure forms of hypertrophy of the pyloric ring, may occur.

The reviewer has seen several patients with spasm of the pylorus leading to complete retention of a barium meal for six hours and dilatation of the stomach which was associated with a cerebellar lesion. Similar retention has also been found by him in patients suffering from myxœdema, but this has been relieved by the administration of thyroid. The possibility of the presence of these factors must be investigated before concluding that the obstruction is due to an intrinsic lesion of the pylorus.

Cholecystography.—The reports during the year from a number of the principal clinics throughout the world indicate that the high degree of accuracy (claimed by the earlier workers) which this method gives in determining the function and pathology of the gall-bladder is being maintained. There are few tests of the function and pathology of viscera which are as accurate as this when it is efficiently performed. Normal functioning of the gall-bladder in a small percentage of cases is associated with the presence of gall-stones; but, as the reviewer has illustrated a gall-bladder full of stones which emptied itself completely, with disappearance of all signs and symptoms of gall-bladder disease, failure to demonstrate in a few cases small collections of gall-stones in a normally functioning gall-bladder is not of serious surgical importance. There is general agreement now that, providing a good technique is followed, the oral method of administration of the tetraiodophenolphthalein is the simplest and compares favourably with the intravenous injection. Kirklin¹⁰ has outlined the persisting errors in the technique of the oral method.

During the year the rapid method of cholecystography devised by Antonucci by which the gall-bladder is visualized two hours after the injection, has been tried out with success by S. Zanetti,¹¹ R. Gilbert and M. J. Demole,¹² G. Zappala,¹³ and G. Barbera.¹⁴ It is claimed for the method that disturbance of hepatic function can be so determined. A paper recording the value of Sandstrom's fractional method of administration of the dye is recorded by L. Sechahaye and S. Kadrnka.¹⁵

Hepatosplenography.—Hepatosplenography with thorium salts, by means of which the outlines of the liver and spleen can be rendered visible and

intrinsic lesions shown, has received further trial in the hands of W. M. Yates and R. S. Otell,¹⁶ who record their findings in 100 cases. They state that no serious immediate or remote ill effects have been detected after two and a half years. They use the method for: (1) The detection of the nature of masses in the upper abdomen; (2) The determination of the presence and nature of hepatic disease; (3) The detection of silent metastases; (4) The detection of rupture of the liver or spleen; (5) The detection of the cause of jaundice; (6) Following the course of disease of the liver or spleen; (7) Determining whether a lesion is above or below the diaphragm; (8) The detection of ascites.

THE THORAX.

Pneumoconiosis.—D. W. B. Wood,¹⁷ in his paper on pulmonary asbestosis, states, "In no department of medicine has the radiologist rendered greater service than in the elucidation of obscure conditions of the lungs such as the pneumoconioses." He showed that asbestosis leads to fine fibrosis, which, commencing in the lung bases, tends to progress, and eventually leads to complete disability, and frequently terminates in death from bronchopneumonia—the dominating symptom during the illness being dyspnoea.

J. F. Bromley,¹⁸ in a paper on silicosis, gives an excellent account of the condition and a brief outline of the liabilities imposed by the Workman's Compensation Act. In 1930, he states, it was estimated that in the previous twenty years £15,000,000 had been paid out in compensation claims for silicosis in the Witwatersrand mines—a figure giving some idea of the serious nature of the disease both to the patient and the industry. It is important to realize that in the Workman's Compensation Act, by silicosis is meant fibrosis due to inhalation of free silica dust, and, as the Act stands at present, free silica dust only. That the radiograph is an essential feature in the diagnosis of the condition is emphasized by the finding of the International Congress on silicosis held at Johannesburg in 1930, that a technically perfect radiograph when interpreted in the light of a thorough clinical examination forms the most reliable single criterion in diagnosis. This opinion is now universally accepted. The radiographic appearance in the early stages is not specific. Similar changes may be seen in chronic bronchitis. Later, when the small fibrous nodules have developed, the appearance is more typical, but even then, owing to the fact that in some areas these nodules coalesce and produce large irregular shadows, these may render it difficult to differentiate the condition from tuberculosis, syphilis, neoplasm, and some cases of chronic bronchitis associated with fibrosis and emphysema. Indeed, pathological lesions of this nature may be superadded to an old-standing pneumoconiosis. It must be realized, therefore, that the radiographic picture of this condition, *which may develop in workers in most dusty occupations*, may show a very varied character. This will be appreciated by a study of *Plates LX–LXII*.

P. Ellman,¹⁹ in his account of asbestosis, states that the onset of symptoms does not generally occur until after five years of exposure to the dust.

J. M. Dyson²⁰ maintains that prominence of the pulmonary artery shadow above that of the left ventricle when observed in miners with no other indication of heart disease is to be regarded as evidence of right ventricular hypertrophy caused by pneumoconiosis.

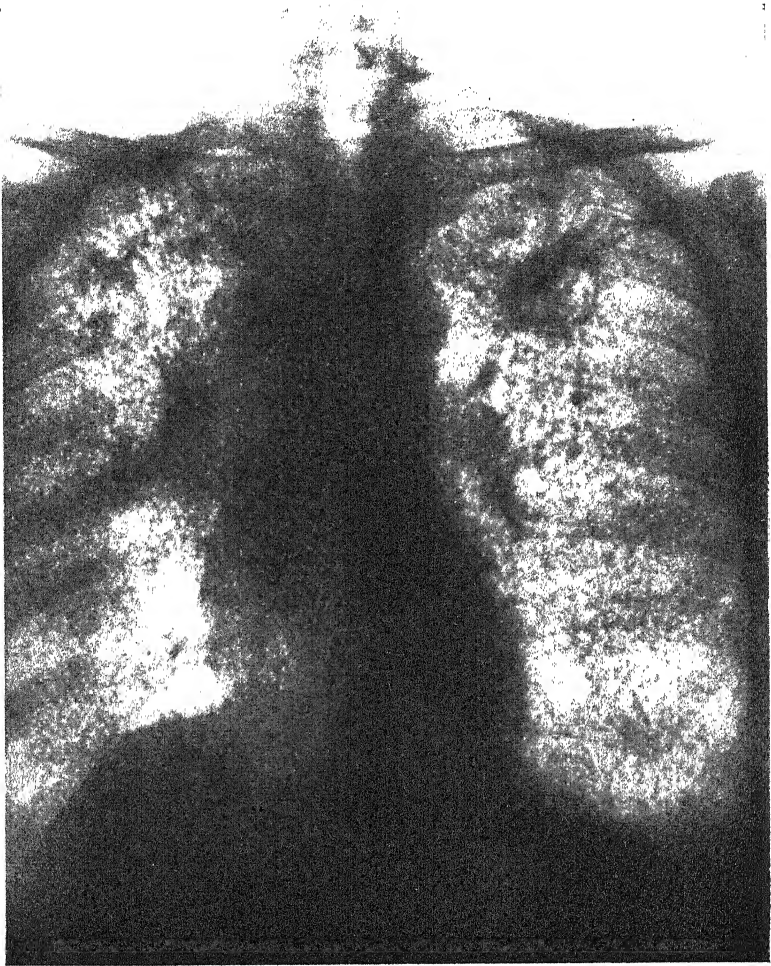
(See also PNEUMOCONIOSIS.)

Heart.—In a paper on the radiology of heart disease, J. V. Sparks²¹ states that the radiograph will provide an accurate estimation of the position, size, and shape of the heart, but a normal cardiac outline does not exclude disease, and for that matter neither does the normal electrocardiograph.

PLATE LX

PNEUMONOCOCONIOSIS

(JAMES F. BRAILSFORD)

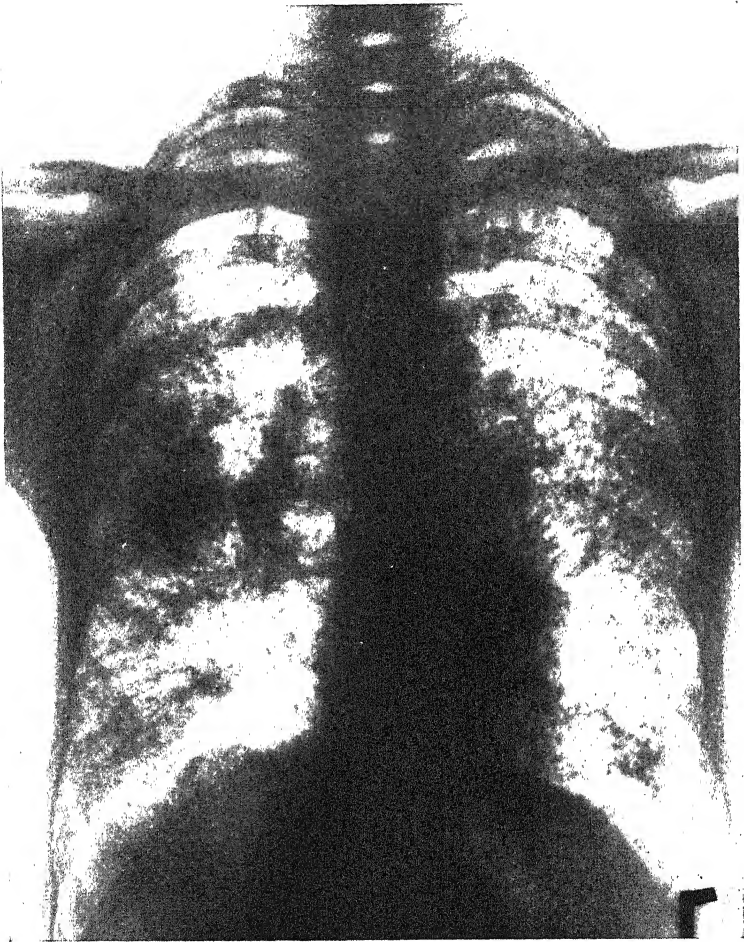


Pneumoconiosis. Note that the small shadows are ring-like in form and that in the upper lobes the deposits have fused to produce shadows suggestive of cavities.

PLATE LXI

PNEUMONOCOONIOSIS—*continued*

(JAMES F. BRAILSFORD)



Pneumoconiosis. The small miliary shadows do not show the ring-like form exhibited in *Plate LX*.

PLATE LXII

PNEUMONOCOCONIOSIS—*continued*

(JAMES F. BRAILSFORD)

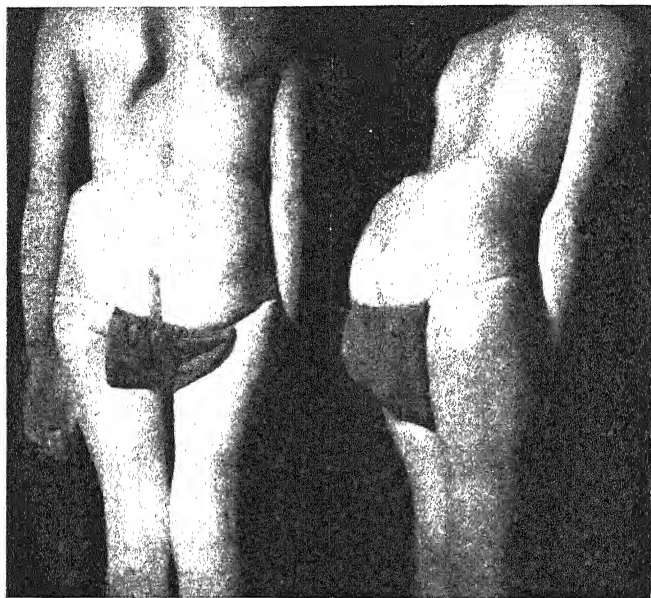


Healed pneumoconiosis. This patient, a man of 52, was diagnosed as miner's phthisis sixteen years ago, when he was a miner in South Africa. His chief symptom was breathlessness. He was forced to discontinue his occupation ; in the interval, during which he has led a sedentary life, he has recovered.

PLATE LXIII

SPONDYLOLISTHESIS

(JAMES F. BRAILSFORD)



Spondylolisthesis. Note the prominence of the 5th lumbar spine, the superficialization of the sacrum, the shortening of the trunk, the break in the lateral curvature of the trunk owing to the collapse of the lumbar spine into the pelvis, and the prominence of the iliac crests.

The orthodiagram is subject to personal error and demands a comparatively long screen examination. The importance of accurate alignment he emphasizes, and shows that deviation will give an abnormal cardiac measurement, and, further, that the transverse diameter of the heart shadow is greater in the prone than in the erect position. (*See also* HEART DISEASE—RADIOLOGY IN.)

Kymography.—The post-war advance in kymography initiated by Robert Knox has received increased attention during the year. By the insertion of a diaphragm made of opaque material, containing narrow slits which extend the width of a radiographic film, between the patient and the film, and by causing the film or diaphragm to travel during the X-ray exposure, it is possible to obtain a radiograph which will record the course of movement in many sections of the heart and large vessels. By analysis of these kymographs, the anatomical structures composing the outlines of the shadows in the mediastinum can be more precisely determined. It may be that, following a careful study of these curves in health and disease, a great contribution towards the elucidation of those cases of heart disease which are associated with a normal radiographic and electrocardiographic record will be effected. The works of Cignolini,²² Raab,²³ and Stumpf²⁴ form interesting reading to cardiologists.

Bernard, Pellissier, and Silberman²⁵ have applied the method in the investigation and location of lesions in the lungs and mediastinum.

BONES AND JOINTS.

The advent of radiography has considerably extended our knowledge of the growth, development, and structure of the bones and joints in health and disease. To-day the science with its advanced technique graphically provides delicate details of osseous changes that may clinch a diagnosis when clinical signs and symptoms are indefinite. The reviewer has compiled an account of the bony changes which he has found and correlated with the clinical and laboratory findings, and has included a review of the radiological literature dealing with this subject. It will be apparent from an examination of this book²⁶ that radiographs of the skeleton are a very essential feature in diagnosis. There is urgent need to stress the value of periodic examination of the changes occurring in normal and irregular growth, in the inception and progress of systemic and localized disease, and before, during, and after the exhibition of various forms of treatment. The fact must be appreciated that the lapse of a few weeks may supply the clinician with striking radiographic evidence, though the first radiographic report may have been of little or no positive value. Again, while various pathological conditions present similar clinical signs, fortunately their respective radiographic appearances are distinctly characteristic, and afford invaluable evidence in diagnosis.

Fracture of the Spine.—In a paper containing an analysis of 270 fractured spines, O. L. Rhys²⁷ points out the importance of withholding information respecting the injury from the patient, as such knowledge may be responsible for affected invalidism with its heavy compensation for the remainder of the patient's life.

Schüller's Disease.—The classification of the American Registry of Bone Sarcoma is dealt with by J. M. Woodburn Morison,²⁸ and a further paper²⁹ by the same author gives an interesting account of the radiographic findings in Schüller's disease, a condition which is characterized by a typical map-like appearance of the skull on a radiograph, exophthalmos, and diabetes insipidus. The condition, though rare, should be familiar to all who are called upon to

interpret radiographs, for in the early stages the lesion responds to X-radiation, but when neglected it progresses, and ultimately the whole of the skull and face may be decalcified, and death may result from minor trauma.

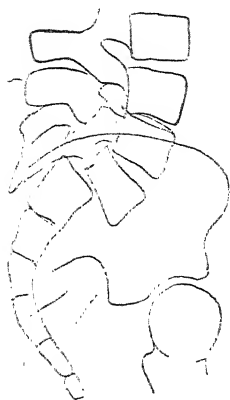


Fig. 58.—Girl aged 9 years. The 5th lumbar vertebra is losing the support of the sacrum and is changing its plane in relation to the upper border of the sacrum.



Fig. 59.—Girl aged 13 years. The inferior surface of the 5th lumbar vertebra appears to be moulded over the antero-superior edge of the sacrum.

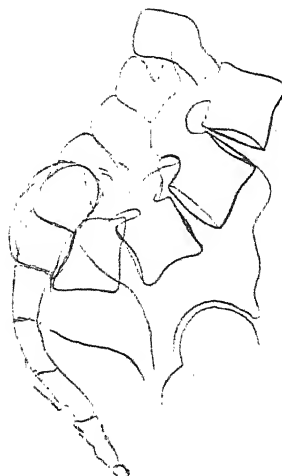


Fig. 60.—Woman aged 38 years. The inferior surface of the 5th lumbar vertebra is gliding down the anterior surface of the bodies of the sacrum.

Figs. 58-60.—TRACINGS OF THE LATERAL RADIOGRAPHS OF THREE SPONDYLOLISTHETIC PATIENTS SHOWING THREE DEGREES OF DISPLACEMENT.

Bone Tumours.—C. Thurstan Holland³⁰ has contributed a very interesting and well illustrated account of benign giant-cell tumours of bone in unusual sites. Papers by J. E. A. Lynham³¹ and the present writer³² discuss the differential

PLATE LXIV

SPONDYLOLISTHESIS—continued

(JAMES F. BRAILSFORD)

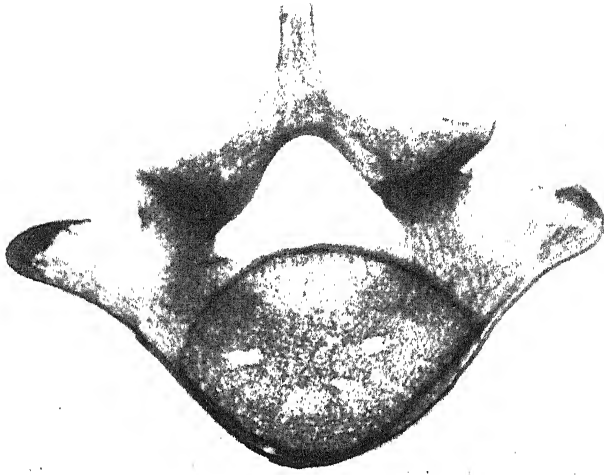


Fig. A.—Radiograph of the 5th lumbar vertebra from the superior surface, showing the characteristic bow line of the anterior surface of the body and transverse processes.



Fig. B. The characteristic bow line of spondylolisthesis.

Fig. C.—Tracing from a radiograph of a case of spondylolisthesis. Antero-posterior view showing characteristic bow line of the 5th lumbar vertebra projected against the shadow of the flattened sacrum. There is a suggestion that the neural arch is ununited to the body.

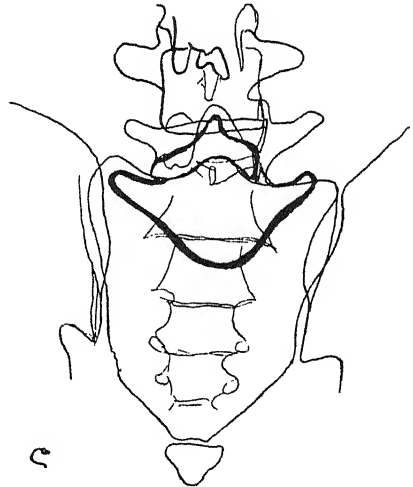


Fig. C.

diagnosis of bone tumours from their radiographic appearances, and I. Lattman³³ contributes a paper on the radiographic appearance of Ewing's tumour.

Spondylolisthesis.—The condition so named has attracted the attention of a number of writers during the past few years. In this affection solution of continuity of the lumbo-sacral joint occurs and the lumbar spinal column gradually glides forward over the upper end of the sacrum as illustrated in *Figs. 58–60*. A number of cases of fracture-dislocation at the lumbo-sacral joint have been recorded as cases of spondylolisthesis, but in these cases the dislocation is immediately produced and is not followed by further slipping, and consequently should not be recorded as spondylolisthesis. It is because of this error in classification that some authorities regard the lesion as being more common in males than females. It produces a characteristic clinical appearance (*Plate LXIII*) and is of great importance in females because of obstruction at the pelvic brim by the projecting lumbar vertebra. The kyphos deformity may be mistaken for bone tuberculosis. From a clinical and radiographic examination of a number of these cases the reviewer³⁴ deduces the following conclusions:—

1. Spondylolisthesis is more common in females than in males.
2. The characteristic bow line of the 5th lumbar vertebra in the antero-posterior radiograph projected against the shadow of the flat sacrum is pathognomonic of the lesion (*Plate LXIV*).
3. Interpretation of the lateral radiograph is liable to a number of fallacies.
4. The patient is rarely brought for examination until deformity or pain is present; consequently the first radiographs usually show well-marked displacement.
5. The term 'pre-spondylolisthesis' should not be applied to cases showing an altered lumbo-sacral angle.

REFERENCES.—¹*Brit. Jour. Radiol.* 1934, July, 415; ²*Proc. Roy. Soc. Med.*, 1934, 591; ³*Brit. Jour. Radiol.* 1934, Feb., 111; ⁴*Presse méd.* 1934, Jan. 27, 153; ⁵*Ann. of Surg.* 1933, Oct., 672; ⁶*Amer. Jour. Surg.* 1933, Sept., 392; ⁷*Surg. Gynecol. and Obst.* 1934, Jan., 52; ⁸*Amer. Jour. Roentgenol.* 1933, xxix, 417; ⁹*Brit. Jour. Radiol.* 1933, Nov., 644; ¹⁰*Jour. Amer. Med. Assoc.* 1933, Dec. 30, 2103; ¹¹*Presse méd.* 1934, May 23, 848; ¹²*Ibid.* 1933, Nov. 18, 1823; ¹³*Políclinico*, 1933, Sept., 541; ¹⁴*Ibid.* Aug. 7, 1244; ¹⁵*Presse méd.* 1933, Dec. 20, 2068; ¹⁶*Jour. Amer. Med. Assoc.* 1933, Aug. 12, 507; ¹⁷*Brit. Jour. Radiol.* 1934, May, 277; ¹⁸*Ibid.* 263; ¹⁹*Ibid.* 281; ²⁰*Amer. Jour. Med. Sci.* 1933, Aug., 165; ²¹*Brit. Jour. Radiol.* 1933, Dec., 723; ²²*Radiol. Med.* 1932, xix, No. 4; ²³*Fortis. a. d. Geb. d. Röntgenstrahlen*, 1933, xlviii, 55; ²⁴*Ibid.* 3; ²⁵*Presse méd.* 1933, Dec. 20, 2053; ²⁶*The Radiology of Bones and Joints*, 1934, J. & A. Churchill; ²⁷*Brit. Med. Jour.* 1934, i, April 14, 655; ²⁸*Brit. Jour. Radiol.* 1934, April, 208; ²⁹*Ibid.* 213; ³⁰*Ibid.* 227; ³¹*Ibid.*; ³²*Ibid.* 233; ³³*Ibid.* 194; ³⁴*Ibid.* 1933, Nov. 666.

X-RAY AND RADIUM THERAPY. (*See also various allusions, passim.*) James F. Brailsford, M.D., M.R.C.S.

The report¹ of the Committee of the Section of Radiology of the Royal Society of Medicine contains an analysis of the work accomplished in several large research centres. The workers at the Memorial Hospital, New York, and at Brussels believe that the 4-grm. radium pack gives better results in deep radiation than any other method in use hitherto. A selective action of the shorter wave-lengths of radium is believed in, and it is thought that the longer exposure with the radium bomb makes it superior to X rays as they are generally used at present. On the other hand, Holfelder and Paterson consider bomb therapy of no greater value than X-radiation, and infinitely more costly. The report deals with administration, control, and selection of patients, bomb therapy, value of radiation in operable cases, and of X rays generated at 200 K.V. and over. It states that the results in operable cases of cancer of the skin, lips,

tongue, tonsils, uterus, and all sarcomata obtained by radiotherapy are better than those obtained by surgery, and that in inoperable cases radiation when properly administered can prolong life, relieve symptoms, and give some five-year cures even when metastases have been detected. Some of the most striking results are seen in extensive bone metastases. The report indicates that greater importance is attached to radiotherapy abroad than in this country, and that the joint examination of the patients by surgeons and radiotherapists immediately before the first treatment has a great practical value which is not everywhere well understood.

The relative backwardness of radiotherapy in England is considered to be due largely to the prevailing surgical attitude to radiotherapy, i.e., that it is merely an accessory surgical measure and is considered only in those cases thought to be inoperable.

Metastases in Breast Carcinoma.—F. Hernaman Johnson,² writing on metastases in breast carcinoma, concludes that: (1) Metastases are now the principal cause of death from breast cancer; (2) Every patient with carcinoma of the breast is liable to metastatic invasion, whether surgery or radium is used to deal with the primary condition; (3) Metastases may arise from cells which have escaped operative removal or death by radium, or they may be already present in embryo in the spine or elsewhere at the time of operation; (4) It is not possible to kill all malignant cells, widely scattered as they may be, by any form of radiation, but suitable X-ray treatment will help to stimulate the body itself to deal with them; (5) The fact that the method of attack is indirect makes it imperative that the response of the tissues should not be exhausted: hence we should not aim at doing anything by a single course of treatment, but should give treatment from time to time over a period of years; (6) Agents which act solely by affecting the body as a whole should not be neglected—of these, ultra-violet light is of proved value, but all measures which provide mental and physical health are of importance and the general effect of X rays themselves must not be left out of account; (7) Radiation therapy, however modified and improved, may never be an ideal weapon against metastases, but at least its possibilities in this direction should be fully explored, as at the moment it is the only line of treatment which holds out any hope of lessening the death-rate from this cause.

Higher X-ray Voltages.—Albert Soiland³ refers to the high-voltage tube designed and built by C. C. Lauritsen five years ago, and suggests that it will replace the radium pack, chiefly on the ground of expense. He states that, whereas with 200 K.V. peak a depth dose of approximately 38 per cent is obtained at a depth of 10 cm., with 500 K.V. peak practically 45 per cent depth dose is obtained at that level. He notes a much lessened skin reaction when using this high voltage, but as yet cannot claim any better results than with the lesser voltage.

Thyroid.—In a paper on X-ray treatment in some conditions of the thyroid and thymus, Hugh Davies⁴ states that recurrence of symptoms in the primary cases of hyperthyroidism treated by operation is as high as 6 to 7 per cent, and that this must be taken into account when considering the statistics of successful results of X-ray treatment as compared with operation. When care is exercised the risk of skin damage should be nil and myxœdema negligible. Further, there is the advantage in X-ray treatment that dosage can be graded.

Actinomycosis.—R. S. Harrison⁵ reports on 30 cases of microscopically verified actinomycosis which had been treated by X-radiation. In 22 cases the disease was localized to the head and neck. The treatment was invariably successful. In 8 cases of actinomycosis of other organs the results of treatment

by the disjuncted fractional method were unsatisfactory. The results of treatment by the disjuncted fractional and the protracted fractional methods have been contrasted, and the protracted fractional method has been found to be advantageous.

Inflammatory Lesions.—The writer would again stress the importance and value of X-radiation in the treatment of inflammatory conditions of the skin, mucous membranes, accessory sinuses, and tonsils. The good results published by workers in different countries serve to confirm the remarks which have previously appeared in the MEDICAL ANNUAL.

REFERENCES.—¹*Brit. Jour. Radiol.* 1933, Dec., 751; ²*Ibid.* Aug., 468; ³*Jour. Amer. Med. Assoc.* 1933, Sept. 30, 1055; ⁴*Brit. Jour. Radiol.* 1934, Jan., 362; ⁵*Ibid.* Feb., 98.

YAWS. (See also SYPHILIS.) *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

SYMPTOMATOLOGY.—A clinical statistical study of over 5000 cases of yaws seen in Liberia has been made by G. H. Harley,¹ who found the following cardinal symptoms or types of lesions present in over 20 per cent of them—namely: palpable epitrochlear glands, rheumatic pain, ulcers and scars, bone lesions, planto-palmar dermatitis, atrophic or hypertrophic changes in the nails, and joint lesions. The last five were met with in 68 to 81 per cent of the patients. The association of the different symptoms is considered in detail, with illustrative tables, in the hope of helping in the differentiation between yaws and syphilis; and the author recognizes three types of active advanced cases, characterized by ulceration of the skin and soft parts, by rheumatic pains with involvement of the bones, and a latent type with changes in the skin, especially where subject to constant wear and friction. Lastly, he deals with goundou and gangosa, and concludes that both are very closely related to each other and are undoubtedly manifestations of yaws in Liberia.

TREATMENT.—Treatment by *halarsol* is reported on by K. W. Todd.² In 4- to 5-c.c. doses of a 2.3 per cent solution intravenously or intramuscularly in adults it changed a positive reaction by Meinicke's turbidity or Trubung's reaction (which he found by a technique described as simpler and more satisfactory than the Wassermann reaction) into a negative one. S. Golovine³ discusses the treatment of yaws by various arsenical preparations and by potassium iodide, and he found the best and least toxic of the former to be acetylarsan, as it cured the disease completely in a very short time, such as by three or four weekly injections, and it soon attracted numerous patients from the villages. On the other hand, potassium iodide requires very prolonged treatment which greatly increases its cost.

G. H. Fitzgerald, P. K. Das Gupta, and N. C. Dey⁴ report on the treatment of yaws in India with a view to finding an efficient, yet cheap and painless, form of injection. They have tested a number of drugs and followed up their cases and done serological tests to ascertain if cures had resulted. With neosalvarsan alone about 80 per cent were clinically or serologically positive two years after treatment. Bismuth preparations alone also failed to give many lasting results, and two Calcutta preparations, 'bisnene' and 'bismochin' were useless or dangerous; 'casbis' was more convenient. Relapses in a few months were very frequent. Halarsol gave immediate clinical improvement, with relapses yielding to further treatment, and a total dosage of 25 to 40 c.c. was required. The best results were obtained by combinations of salvarsan and bismuth and of halarsol and bismuth, but the elimination of the disease is difficult to effect.

REFERENCES.—¹*Jour. Trop. Med. and Hyg.* 1933, Aug. and Sept., 217, 235, and 252; ²*Ibid.* 1933, Aug. 15, 233; ³*Presse méd.* 1934, June 13, 959; ⁴*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, Jan. 31, 371.

YELLOW FEVER.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

EPIDEMIOLOGY.—A further important report on the past incidence and distribution of yellow fever in West Africa has been published by the Rockefeller Foundation workers, H. Beeukes and A. F. Mahaffy,¹ dealing with tests of no fewer than 7580 sera collected in 181 places to ascertain if they gave evidence of earlier infection by yellow fever by the continued presence in them of protective substances against the virus of the disease. The existence of an extensive endemic area in South-west Nigeria and of outbreaks from time to time of epidemics in North Nigeria, the Gold Coast, Sierra Leone, Liberia, and Gambia, has been clearly established, and approximately 25 per cent of the entire series of bloods examined gave positive results, indicating that few towns had escaped the disease during the lifetime of the present generation. Where a large proportion of the children gave positive results yellow fever must have been epidemic fairly recently; where only adults were positive the last outbreak must have been a considerable time back. The indigenous population rarely show typical attacks of yellow fever, but the occurrence of typical cases in adults indicates simultaneous mild infections among the natives. The blood of a number of Europeans tested gave no evidence of any appreciable number of mild unrecognized cases having occurred among them. The Sahara Desert appears to form an effective barrier against the spread of the disease as indicated by the absence of positive serum among the population of places extending into the barren French territories from N.W. Nigeria. The long dry cold season of N. Nigeria appears to limit the disease to occasional epidemics in the warmer season and to prevent its becoming endemic. Piped water-supplies and effective *Aedes*-reducing sanitary measures appear to have reduced or eliminated yellow fever in Freetown, Sierra Leone, and some other coastal cities of British West African territory. A further report on French Territories is promised in the near future.

IMMUNIZATION.—The immunization of 200 persons against yellow fever by the use of a combination of yellow fever serum and mouse-fixed virus, which produces immunity in monkeys and man without any danger of causing the general infection of yellow fever, is reported by G. M. Findlay,² who visited the Rockefeller Foundation Yellow Fever Laboratory under W. A. Sawyer before taking up the work. The virus is prepared from the brains of mice after cerebral infection with a neurotropic virus obtained by at least 110 passages of the original virus, and the serum from Wassermann-negative donors who have previously suffered from yellow fever, and is necessarily limited in amount, but a serum can also be prepared in horses. The inoculated include both men and women going to live in the endemic areas in West Africa and laboratory workers exposed to infection while working with virulent yellow fever material, and it is very noteworthy that since such immunization has been regularly carried out, the former frequent laboratory infections have entirely ceased. Three slightly different methods have been tried, and 43 per cent developed febrile reactions, which were mild in all but three, and in no case gave rise to any lasting injury, although in some the virus has been demonstrated for a time in the blood of 2 out of 16 tested, as has the development of immune serum, which commences in nine days, attains its maximum in four to five weeks, and can still be detected at least twelve months after the inoculation. It is thus clear that immunization against the disease is now possible and should be used in the case of all persons travelling from yellow fever endemic areas, such as a large portion of West Africa, to uninfected areas.

The susceptibility of animals to yellow fever has been further investigated by Max Theiler³ in the case of guinea-pigs, in which he has found the fixed yellow fever virus of mice can be maintained by brain-to-brain inoculation for

forty passages, although guinea-pigs are relatively insusceptible to yellow fever virus of monkey origin. The course of the disease in guinea-pigs is essentially the same as in mice after intracerebral injection, for the virus travels centrifugally along nerve tissue without infecting the blood, but it travels more slowly and no alteration in pathogenicity for mice occurs, and it produces an encephalitis, but not the extensive necrosis of the hippocampus of mice. Intraperitoneal injection of the virus into guinea-pigs produces the development of neutralizing antibodies in most of them. The survival of yellow fever virus in ticks has been studied by N. C. Davis,⁴ who obtained infections by injecting emulsions of ticks that had been fed on the blood of a monkey infected with yellow fever from six to twenty-three days previously, several varieties of ticks being used in successful tests. No evidence has yet been obtained that the virus is transmitted by the eggs of infected ticks or that they can convey the disease by their bites. G. M. Findlay and L. P. Clarke⁵ have found the common hedgehog, *Erinaceus erupaeus*, to be very susceptible to the viscerotropic strain of yellow fever virus, and both monkeys and mice can be infected after passage through hedgehogs. Mouse protection tests for yellow fever immunity of residents of the Anglo-Egyptian Sudan have also been carried out in New York⁶ with sera sent there, with the important result that evidence has been obtained of the occurrence from six to thirty years ago of yellow fever in Kordofan, the Nuba Mountains, and in Bahr-el-Ghazal, but not in the drier north-east parts of the province in which aerodromes are situated. Evidence of liver post-mortem changes resembling those of yellow fever is also recorded.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, June 30, 39; ²*Ibid.* March, 437; ³*Amer. Jour. Trop. Med.* 1933, July, 309; ⁴*Ibid.* Nov., 547; ⁵*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, Aug. 4, 193; ⁶*Lancet*, 1934, Sept. 1, 496.

II

THE PRACTITIONERS' INDEX.

NEW PHARMACEUTICAL AND DIETETIC PREPARATIONS,
MEDICAL AND SURGICAL APPLIANCES, ETC.

In this Section we give short descriptions of the Pharmaceutical Products and the New Inventions of the past year. Every care is taken to notice only articles that seem worthy of our readers' attention. It should be understood that the information is supplied by the Makers. We invite all concerned with the Medical Manufacturing Industries to co-operate with us in making this section valuable for present and permanent reference.

A short typewritten description of each article is required, with the advantages claimed for it, and with the Maker's name and address appended. The Editors cannot accept reference to circulars or catalogues as a compliance with these conditions. Illustrations of instruments may be inserted if small.

In the section on Drugs, their composition, principal applications, and dosage should be stated in the fewest possible words.

All particulars for this Section should reach us by November 30.

PROGRESS OF PHARMACY, DIETETICS, ETC.

Acetylcholine Bromide.—A sterile stable solution of this substance has been issued in 'Hypoid' ampoules, each presenting 0.1 grm. in 1 c.c., in boxes of 10. Acetylcholine is usually administered by intramuscular injection and has proved particularly successful in counteracting paralysis of the intestine such as occurs after laparotomy and intestinal operations. It may be used to relieve severe post-operative gas distension and pain, and, to a certain extent, to relieve acute constipation. It is also of value in certain types of vascular disturbances associated with arteriolar spasm. (Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.)

Alkalsa (R & B).—Tribasic phosphates of calcium and magnesium with sodium phosphate. Total content $22\frac{1}{2}$ gr. in two fluid drachms. For neutralization of gastric acidity without rendering the secretion alkaline. Normal digestion is therefore not retarded. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Anaquinine represents an innovation in nasopharyngeal therapy. The convenient shaped-bottle, fitted with Dr. Lescene's drop-counting instillator, contains aldehydes, thymoform, eucalyptol, ephedrine, etc., in solution in a bland vegetable oil. The medicaments can be readily applied in regulated dosage to the nasal mucosa and an effective antiseptic action is produced by the liberation of formal and thymol through dissociation of the aldehydes and thymoform. The use of the special instillator entirely supersedes the ordinary medicine-dropper-method of application in nasopharyngeal therapy, it being so constructed that the adhering drops do not return to the bottle to contaminate the remaining solution. Of particular value in colds, catarrh, coryza, sinusitis, etc., Anaquinine can also be employed as an accessory treatment in influenza, whooping-cough, mumps, and other conditions where disinfection of the nasal passage is desirable. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

Androstin.—Physiologically standardized total testicular extract for administration in the treatment of impotence and various neuroses and psychoses of genital origin. The tablets, each representing the active principles of 8 grm. of fresh gland, are administered in doses of 3 to 8 daily. For injection, separate ampoules (A and B) are supplied containing respectively the hydrosoluble fraction from the spermatid gland and the

liposoluble testicular hormone from the interstitial cells. Ampoules A and B are administered alternately by intramuscular injection. (Ciba Limited, 40, Southwark Street, London, S.E.1.)

Ascorbic Acid.—See REDOXON ; VITAMIN C.

Bee Venom, 'Azoule', and Ointment.—'Azoule' Bee Venom is a stable solution in ampoules in a graduated series of doses (1, 2, 3, 5, 7, 5, and 10 stings) for subcutaneous injection. It can be supplied in any strength up to 10 stings per c.c. Bee venom ointment contains bee venom, benzyl salicylate, and oleo-resin of capsicum. It is supplied in 1-oz. tubes. Successful results have been reported from the use of bee venom in rheumatic conditions, including articular rheumatism, arthritis, rheumatoid and muscular pains, lumbago, and sciatica. Dosage: 30 stings every 3 days have been advocated. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Bismurung c. Vitamins A & D.—Vitamins A and D have proved their value when applied to the skin in protecting from infection and in promoting epithelial regeneration. This additional preparation of the well-known colloidal oxychloride of bismuth ointment 'Bismurung' contains 966 Carr-Price blue units for vitamin A and 9000 biological units for vitamin D in each ounce. Increased percentages can be obtained if desired.

Bismurung Pessaries for cervical erosions, leucorrhœa, gonorrhœa, vaginismus, etc., can also be obtained.

Bismurung Suppositories containing this colloidal Bi.OCl ointment are now available for the treatment of hemorrhoids, fissure, and other rectal diseases. (The Blythwood Chemical Co. Ltd., 213, West Campbell Street, Glasgow.)

Calnesine Tropels present a scientifically-balanced combination of the acetylsalicylates of calcium and magnesium with colloidal aluminium hydroxide. The two salts are more soluble than acetylsalicylic acid and consequently pass rapidly into the intestine and are absorbed there. Colloidal aluminium hydroxide corrects irritation of the gastric mucous membrane. Thus Calnesine possesses distinct advantages over other preparations of acetylsalicylic acid. It is given in rheumatic affections, influenza, chills, neuralgia, and cough. Each tropel contains calcium acetylsalicylate, $3\frac{1}{2}$ gr., magnesium acetylsalicylate, $3\frac{1}{2}$ gr., colloidal aluminium hydroxide, 6 gr., agreeably flavoured. The dose is one or two tropels, as required, to be crushed and taken in water. If free perspiration is needed, two tropels at bedtime followed at once by a tumblerful of hot lemon-water, hot milk, or other beverage. Supplied in tubes of 25; in bottles of 100 and 1000. (Wyleys Limited, Coventry.)

Calsimil is issued in the form of a 10-gr. tablet, containing 5 gr. of calcium sodium lactate and 500 international units of pure crystalline vitamin D (Radiostol). The tablets are so palatable that they can be dissolved in the mouth like an ordinary sweetmeat; on the other hand they can be crunched and swallowed with milk or with some other suitable liquid. Calsimil is scientific in its conception, for not only does it prove a ready and pleasant means of taking calcium, but, by reason of its vitamin D content and the basicity of the calcium salt employed, the optimum calcium assimilation and retention are ensured. Calsimil performs important functions in the prevention and treatment of conditions associated with calcium deficiency, such as: chilblains, eczema, dental caries, morning sickness. (The British Drug Houses Ltd., Graham Street, London, N.1.)

Carbokaylene.—This preparation is obtainable in both granular and tablet form; it combines the detoxicating action of kaylene with the flatulence-reducing properties of highly activated vegetable charcoal. It is indicated in the treatment of gastric flatulence and intestinal fermentation. Dosage: 1 to 2 heaped teaspoonfuls of the granules three times a day between meals, followed by a draught of water, or, alternatively, mixed with water; 3 to 4 tablets three times a day, half an hour before meals. (Kaylene Limited, Waterloo Road, Cricklewood, London, N.W.2.)

Cereal ('Allenburys').—A concentrated, readily digestible, breakfast and supper dish, prepared from whole wheat and barley malt with additional calcium, phosphorus, iron, and vitamins B and D, and cooked ready for use. Analysis: proteins 13.5 per cent; fat, 5.8 per cent; starch, 42.8 per cent; cane sugar, 7.2 per cent; other soluble sugars, 25.2 per cent; moisture, 2.0 per cent; mineral salts, 3.5 per cent; calcium as CaO, 1.03 per cent; phosphorus as P_2O_5 , 1.21 per cent; iron, 33 parts per million; food value, 120 calories per oz. This food provides minerals and vitamins which are lacking in the highly refined cereal products that form so large a proportion of the average diet. It is of special value to children. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Cerebrom is a preparation in which the unpleasant taste of the bromide has been skilfully masked so as to be readily acceptable to the most exacting palate. Each fluid drachm contains: potassium and sodium bromide, 5 gr.; ammonium bromide, 3 gr.; calcium bromide, $1\frac{1}{2}$ gr.; lithium bromide, $\frac{1}{2}$ gr. Dose: 1 to 2 fluid drachms diluted. Cerebrom has an established reputation. (Chas. F. Thackray, Park Street, Leeds.)

Chloroform Capsules.—Crushable glass capsules of pure chloroform, 20 min., in tins of 12, are supplied for use in labour, in accordance with the procedure introduced at Queen Charlotte's and other hospitals. A special clip-on capsule holder and breaker for the anæsthetic mask is supplied. An investigation into 100 vertex presentations (*Brit. Med. Jour.*, 1933, Aug. 5, 241) indicated that this procedure in the second stage of labour was safe and usually beneficial, provided that due care was taken. Sedatives should be given more universally and freely, instead of chloroform, during the first stage, and the assistance of another trained person is essential. Dosage: Average, 3-41 capsules. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

C.M.S. Antiseptic (Wyleys).—This is a product of high bactericidal value specially designed for obstetrical and surgical purposes, also for use as a general disinfectant. The chief constituent, chloro-meta-xyleneol, tested by the Rideal-Walker standardized method for estimating the germicidal strength of antiseptics has been shown to possess a very high bactericidal coefficient (many times greater than phenol). C.M.X. Antiseptic is highly toxic to streptococci, and is consequently very efficient in preventing puerperal sepsis. It is perfectly safe in unskilled hands. Supplied in bottles of 4 oz. and 80 oz (Winchesters); also in 1 gallon free cans. (Wyleys Limited, Coventry.)

Cobefrin is a new vasoconstrictor with an action similar to adrenalin, but with much less toxicity. Chemically, it is represented by the formula 3, 4-di-hydroxy-phenyl-amino-propanol. It may be utilized in all surface infiltration and conducive anæsthesia in conjunction with novocain. It causes none of the toxic by-effects or collapse symptoms which frequently follow the use of adrenalin, and may be used on elderly patients and those suffering from hyperthyroidism, heart disease, high blood-pressure, and arteriosclerosis, without ill effects. (Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.)

Cutipel.—This is a new, almost greaseless ointment base to satisfy the requirements of modern dermatology. It is cool and clean in use, dressings being frequently unnecessary. A number of stock formulæ with this base are available, or physicians' own special prescriptions can be made up. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Devegan is issued in tablet form for the treatment of leucorrhœa, especially when due to *Trichomonas vaginalis*, and for dysfunctional states of the vaginal mucous membrane. The tablets contain 4-oxy-3-acetyl-amino-phenyl-arsonic acid and also boric acid, with carbohydrate hydrolysed by a special process as vehicle. One to two tablets are inserted as high up the vagina as possible from one to three times daily, and treatment can be continued as long as desired, according to the severity of the case. (Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.)

Digifortis in Ampoules.—Each ampoule contains 1 c.c. of a solution that presents the whole of the active principles of digitalis without inert matter. The solution is free from colour; in this it differs from digifortis (in 1-oz. bottles) for oral administration. Each ampoule contains the equivalent of one digifortis tablet or 10 min. of the liquid digifortis for oral use. The activity of digifortis solution in each c.c. ampoule is 0.8 international unit. (Parke, Davis & Co., 50, Beak Street, London, W.1.)

Diphtheria Toxoid (Alum Precipitated) is the purified precipitate obtained from standardized diphtheria toxoid by the addition of aluminium and potassium sulphate (alum). The effectiveness of this product lies in the fact that the antigen is in a slowly soluble form and is absorbed very gradually by the tissues. This allows it to manifest its antigenic or immunizing properties continuously over an extended period of time. Thus, one injection of 0.5 c.c. is said to produce the same amount of protection that usually follows three injections of any other diphtheria prophylactic. (Parke, Davis & Co., 50, Beak Street, W.1.)

Emmenin Complex.—The orally active oestrogenic hormone derived from the placenta, prepared and biologically standardized in accordance with the technique of Dr. J. B. Collip, Department of Biochemistry, McGill University. It is regarded as a hydrolysable complex of trihydroxy-œstrin, the potency of which is increased in the presence of ovarian tissue. It supplements the oestrogenic activity of the hypo-functioning ovary, and thus produces results of a more permanent character than those of mere substitution

therapy. Indicated in the treatment of menopausal disturbances, 'menstrual' headache, dysmenorrhœa, and oligomenorrhœa. Dosage: one teaspoonful daily in water. If necessary may be increased gradually to four teaspoonfuls daily. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Entero-vioform.—Tablets containing 0.25 grm. of vioform for administration in the treatment of chronic amebiasis and other parasitic intestinal diseases. Vioform is iodochloroxyquinolin and was favourably referred to by Sir Leonard Rogers in the *MEDICAL ANNUAL*, 1934 (pp. 21, 22). (Ciba Limited, 40, Southwark Street, London, S.E.1.)

Eugastrol (Dry).—An almost tasteless powder of desiccated hog's stomach: 1 grm. of this product is equivalent to approximately 8 grm. of fresh stomach. One tablespoonful of the powder weighs approximately $\frac{1}{4}$ oz. and is equivalent to about 2 oz. of fresh stomach. Dosage: One to four tablespoonfuls daily. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Farex Cereal Food (Precooked).—A palatable, comprehensive, and highly digestible cereal food rich in proteins, carbohydrates, fat, vitamins A, B₁, B₂, D, and E, and minerals (including calcium, phosphorus, iron, and copper). It provides in one food all the dietetic components required to promote and maintain normal health, and can therefore be taken, without any other dietetic supplement, over long periods of time. Indicated in all conditions where a restricted diet is necessary, and particularly suitable for the dietetic treatment of gastric disorders, including gastric ulcer. The special advantage of Farex is that it may be served with hot or cold milk without any preparation. It needs no cooking. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Ferrodic Iron Granules.—Chocolate-flavoured granules containing ferrous phosphate and glucose. One drachm is equivalent to 10 gr. of Bland's pill or 4 fluid drachms of syr. ferri phos. co. Ferrodic appeals strongly to children who will not take ordinary iron preparations, such as chemical food. Its iron is present in the ferrous state, being preserved from oxidation by the presence of the reducing sugar (glucose). The large proportion of this sugar gives the preparation a special value in ketosis (acidosis), a condition which is found in debilitated children. Sprinkled on bread-and-butter, the granules provide a solution to the problem of feeding children who have no appetite. Dosage: One or two teaspoonfuls three times a day, after meals. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Ferrous Sulphate Tablets (G. L.).—An exceptionally convenient and economical iron preparation. Each tablet is equivalent in iron content to two 5-gr. Bland's pills B.P. and contains also $\frac{1}{100}$ gr. each of copper and manganese, both present as sulphates. The tablets are outstandingly effective in the treatment of deficiency anemias in children, in the routine care of expectant and nursing mothers, and for all iron deficiencies, including those due to hæmorrhage. Dosage: Two or three tablets daily at the physician's discretion. In the course of massive iron therapy, doses in the order of 6 or 9 tablets a day can be given. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Gestone.—The corpus luteum hormone. In 1-c.c. ampoules standardized to contain 2 rabbit units. Packed in boxes of 6 ampoules. (Painos & Byrne Ltd., Perivale, Greenford.)

Glycine B.D.H. (Aminoacetic Acid) is acetic acid with one of the hydrogen atoms replaced by the amino group. The value of this product in medicine has been brought into prominence recently as a result of a report on the success which followed its use in the treatment of progressive muscular dystrophy, in myasthenia gravis, and in similar conditions of deficient muscular tonus. Following this discovery it has been found that when it is used in conjunction with ephedrine in the treatment of myasthenia gravis still further benefit is experienced. Glycine B.D.H. is available in the form of a white crystalline substance with a sweetish taste; it is readily soluble in water, it is non-toxic, and when administered orally, it acts as a diuretic after the manner of amino-acids in general. (The British Drug Houses Ltd., London, N.1.)

Glyco-Karvolene (Collosol Brand).—One of the eight items now forming the Karvol series of preparations of which the base is collosol brand chlor-carvacrol 5 per cent, a product more than twenty times stronger than pure phenol, with a wide field of utility fulfilling the necessary æsthetic conditions for both toilet and surgical use. It is worthy of note that chlor-carvacrol is active in the presence of serum. The range includes: Karvol mouthwash, Karvol dental cream, Karvol inhalant, Karvol liniment, Karvol surgical soap, Karvoleum 1 per cent, Karvol insect bite lotion. (The Crookes Laboratories, Park Royal, London, N.W.10.)

Gonadotraphon.—The anterior pituitary gonadotropic hormone. It is provided in the dry state, 100 rat units in each ampoule. With each ampoule an ampoule of solvent material is provided. Solution is made immediately before injection producing an isotonic painless injection of full strength of 100 rat units. Supplied in boxes of 5 double ampoules. (Paines & Byrne Ltd., Perivale, Greenford.)

Halibut-liver Oil (Crookes').—The original All-British halibut-liver oil supplied in capsule or liquid form and also in the various combinations enumerated below. It is standardized and guaranteed to give a vitamin A value not less than eighty times more than that of the finest cod-liver oil, and over three hundred times that of the minimum cod-liver oil suggested as B.P. standard. (The Crookes Laboratories, Park Royal, London, N.W.10.)

Halimalt.—Crookes' halibut-liver oil and malt extract makes an exceptional appeal to children. It contains Crookes' halibut-liver oil (vitamins A and D) with the purest malt extract (vitamin B) and orange juice (vitamin C). Very palatable, and, unlike cod-liver oil preparations, is free from fishy flavour. (The Crookes Laboratories, Park Royal, London, N.W.10.)

Halivite (Scott's Halibut-liver Oil).—Scott's Halivite is pure halibut-liver oil biologically standardized to exhibit both the fat-soluble vitamins in the same balance proportion as in cod-liver oil. It is said to have the highest vitamin D potency ever obtained with halibut-liver oil, and is guaranteed free from added vitamins in any form. Each drop of Scott's Halivite equals approximately one teaspoonful (4 c.c.) of standard medicinal cod-liver oil in both the vitamins.

Scott's Halivite Pills (each containing two drops of actual oil) represent an ideal method of administration. (Scott & Bowne Limited, Manufacturing Chemists, 10, Stonecutter Street, London, E.C.4.)

Halmagon.—This is put up in tablet form and as an emulsion for intravenous injection. Composition: Halogen salts of magnesium of special origin and preparation. It is an entirely new therapeutic measure whose general positive action is said to heighten greatly the efficient functioning of the body activities. This action is evidenced by a feeling of increased mental and physical vigour, calmness of outlook, and optimism. Indicated specifically in asthenia, general debility, lowered vitality, lack of physical tone and mental 'grip', insomnia, and nervous irritability. Has also several interesting special indications, such as frequency of micturition and prostatic enlargement, gall-bladder conditions, pruritus, and certain skin blemishes, etc. (Tonicity Laboratories, Limited, 26, Gt. Ormond Street, London, S.W.1.)

Halycalcyne.—This product (Crookes' halibut-liver oil with calcium phosphate) may be regarded as a useful adjunct in the treatment of chilblains and circulatory deficiency. The very high vitamin A content of the halibut-liver oil tends to promote a healthy condition of all epithelial linings; hence, in all circulatory conditions the administration of this essential vitamin is indicated. In dental caries or decay also, and in the necessary attention to children's teeth, Halycalcyne plays a very valuable part. The vitamin D content supplies the deficiency of this essential factor without which utilization of calcium phosphorus cannot take place; and the calcium phosphate content of the preparation—the balance of which in the blood is so important—supplies any dietary deficiencies of these two important elements. (The Crookes Laboratories, Park Royal, London, N.W.10.)

Halycitrol.—Each teaspoonful of this preparation (Crookes' halibut-liver oil with orange juice and glucose) is equivalent in vitamin A to its own volume of the finest cod-liver oil, with an adequate dosage of vitamin D. It has no artificial vitamins, but contains fresh orange juice (vitamin C) and the valuable dietetic glucose. Halycitrol thus presents in an extremely palatable form those most valuable accessory food factors, the natural vitamins A, C, and D. It enables the fastidious invalid or the delicate child to take halibut-liver oil without the slightest difficulty, and in all those cases where there is a contra-indication or trouble in administering a malt extract product. (The Crookes Laboratories, Park Royal, London, N.W.10.)

Hepastab.—A concentrated sterile solution of the anti-anæmic factor of mammalian liver specially prepared for intramuscular injection in the treatment of pernicious anæmia. Every batch of Hepastab is tested clinically and proved to be hæmopoietically active before issue. Hepastab is indicated in the treatment of: Patients who are severely ill and are unable to take medicine in any form; patients who cannot take adequate amounts of liver or liver extracts on account of gastric intolerance; patients who are refractory to oral liver therapy; patients with progressive or stationary neuralgic signs or symptoms. In this condition Hepastab should be combined with Pepsac

(Desiccated Stomach Substance--Boots). The average dosage is 4 c.c. on the first day, followed by 2 c.c. daily on the succeeding three or four days. Further maintenance doses of 2 c.c. may then be given at intervals of two to six weeks at the discretion of the physician, subsequent dosage being controlled by blood-count and the condition of the patient. Supplied in ampoules of 2 c.c. (Boots Pure Drug Company Limited, Nottingham.)

Hepol Liver Products.—Concentrated, convenient preparations of the principle that is effective in pernicious anaemia, free from the disadvantage of the taste of liver. The doses mentioned are those necessary until the blood picture is normal.

Hepol Dry (equal in strength to the B.P. dry extract).—1 tube = 8 oz. of fresh liver. Daily dose: 1 tube.

Hepol Dry ($\frac{1}{2}$ size).—1 tube = 4 oz. of fresh liver. Daily dose: 2 tubes.

Hepol Liquid (equal in strength to the B.P. liquid extract, but with attractive flavouring).—1 oz. = 8 oz. of fresh liver. Daily dose: 1 oz.

Hepol Elivir.—1 oz. = 4 oz. of fresh liver. Daily dose: 2 oz.

Hepol Capsules.—1 capsule = 1 oz. of fresh liver. Daily dose: 8 capsules.

Hepol Capsules ($\frac{1}{2}$ strength).—1 capsule = $\frac{1}{2}$ oz. of fresh liver. Daily dose: 24 capsules.

Hepol Sterilized Solution, for intramuscular and intravenous injection, contains 'fraction G', has been tested physiologically, and is free from protein and histamine. Each batch is standardized by carefully controlled tests on cases of pernicious anaemia. 2 c.c. is prepared from 40 grm. of fresh liver, and is therapeutically equivalent to at least 1000 grm. of fresh liver taken by mouth. Average dosage: 2 c.c. daily till the blood is normal; then, usually, 4 c.c. per week.

Byno Hepol, a combination of 'Bynin' Liquid Malt with Hepol Liver Extract, is very palatable and helps digestion. Three tablespoonfuls are equivalent to 8 oz. of fresh liver. Daily dose: Three tablespoonfuls.

Hepol L.Y.H.—1 fluid ounce contains the extract from 4 oz. of fresh liver, the equivalent of 40 gr. of fresh yeast, and an ample amount of haemoglobin. Hepol L.Y.H. is designed for use in debility with a tendency to anaemia. Dosage for this purpose: A dessertspoonful thrice daily, with water, after meals.

Hepol Elivir with Iron.—1 fluid ounce contains the extract from 4 oz. of fresh liver with 30 gr. of iron and ammonium citrate. It is for use in secondary anaemia and, in the remission stage of pernicious anaemia, as a means of preventing subacute combined degeneration. Dosage: One or two dessertspoonfuls or more daily, with water. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Imadyl Preparations.—Imadyl histamine preparations have been recommended by Continental and British workers for the treatment of rheumatic conditions, e.g., osteo-arthritis, fibrositis, chronic articular gout, myalgias, neuralgias, arthralgias, etc., and the circulatory disturbances associated with such conditions. Imadyl is available in the form of ointment for use by ionization, inunction, and massage; tablets for preparing ionization solutions; and ampoules for injection. The latter are used in gastric acidity tests (test-meal) as well as in the treatment of rheumatic conditions. Imadyl ointment contains 2 per cent histamine in a suitable base and is supplied in collapsible tubes of 10 grm. each. Imadyl tablets each contain 0.05 grm. histamine, and are supplied in tubes of 5 tablets. Imadyl ampoules (also known as Imido 'Roche') each contain 1 c.c. of 1-1000 solution, and are supplied in boxes of 6 ampoules. (The Hoffmann-La Roche Chemical Works Ltd., 51, Bowes Road, London, N.13.)

Insulin (Cryst.)—'Wellcome' Brand.—The first commercial insulin made from pure crystalline insulin is now available in 5-c.c. phials containing 20 units per c.c. This represents a remarkable advance since insulin was issued some ten years ago, when the average commercial batch was made from material containing only some 2 or 3 units per mgrm. (Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1.)

Ketodestrin.—Standardized oestrous-producing hormone of the chemical composition keto-hydroxy-œstrin. It is supplied in ampoules containing 100 m.u. (500 int. u.), 1000 m.u., (5000 int. u.), 10,000 m.u. (50,000 int. u.), and 50,000 m.u. (250,000 int. u.), in boxes of 6 ampoules. (Paines & Byrne Ltd., Perivale, Greenford.)

Krescone.—The anterior pituitary hormone which promotes growth of bone. Supplied in 1-c.c. ampoules in boxes of 6 and 12. (Paines and Byrne Ltd., Perivale, Greenford.)

Lacto-kaolin (Collosol).—A combination of collosol kaolin with lactose specially indicated in ulcerative colitis. Collosol kaolin has achieved a great measure of success in all forms of intestinal toxæmia. It is a comminuted neutral powder in a very fine state of subdivision, prepared by the precipitation of a colloidal suspension of kaolin or china clay. (The Crookes Laboratories, Park Royal, London, N.W.10.)

Larostidin Brand Histidine gives to medicine a new and highly successful method of dealing with gastric, duodenal, and jejunal ulcers. It consists of a sterile, isotonic, 4 per cent solution of histidine monohydrochloride and is supplied in boxes of 6 and 25 ampoules, each containing 5 c.c., for subcutaneous or intramuscular injection. Treatment consists in the daily administration of one Larostidin ampoule for about three weeks. As a rule no other therapeutic measures are necessary, and unless he is unfit for work the patient may continue his ordinary occupation. After four or five Larostidin injections, pain disappears, and nausea, vomiting, hyperacidity, etc., are relieved. After ten days a normal diet may be resumed. Appetite increases with gain in weight and improvement in general conditions. X-ray photographs appear to confirm the beneficial results observed clinically in the disappearance of symptoms. Special measures are necessary when hæmorrhage is present. Important features of the Larostidin treatment are its comparatively moderate cost, and its avoidance of special ulcer diet, prolonged rest treatment, and operative measures. (The Hoffmann-La Roche Chemical Works Ltd., 51, Bowes Road, London, N.13.)

Livron.—Specially prepared for administration in a palatable form of massive doses of iron in combination with the active constituents of mammalian liver and other ingredients of therapeutic value, Livron is recommended for the treatment of the 'secondary' and nutritional anæmias (other than pernicious anæmia), simple anæmias of infancy, post-hæmorrhagic anæmias, 'secondary' anæmias of pregnancy, and all cases where hæmoglobin regeneration needs to be increased. Each fluid ounce contains 90 gr. of iron ammonium citrate. The adult dose is 1 tablespoonful twice daily. Supplied in bottles of 4 and 8 fluid ounces. (Boots Pure Drug Company Limited, Nottingham.)

Meningococcus Antitoxin, supplied in vials of 10 c.c. containing 10,000 units, is obtained from the blood of horses immunized by the injection of meningococcus toxin, and differs from antimeningococcus serum in that it neutralizes the toxin elaborated by the meningococcus. As early as possible after the diagnosis is established, or in doubtful cases where meningococcus meningitis is suspected, 20,000 to 30,000 units of the antitoxin diluted with 120 to 200 c.c. or more of normal saline or of 10 per cent glucose solution should be introduced slowly into the vein. In the ordinary case the intravenous dose should be repeated every twenty-four hours. (Parke, Davis & Co. 50, Beak Street, London, W.1.)

Myocrisin (oily and aqueous solutions).—Sodium aurothiomalate, a gold preparation containing 50 per cent gold. For intramuscular injection in the treatment of pulmonary tuberculosis, rheumatoid arthritis, and lupus erythematosus. Dosage: After an initial dose of 0.01 grm., the dosage is increased gradually to 0.05, 0.1, and 0.2 grm. (8 to 10 injections). An interval of 4 to 6 weeks should be allowed between courses and two to three courses are generally advocated. (May & Baker Ltd., Battersea, London, S.W.11.)

Nazotone.—An antiseptic fluid for nasal injection containing cedrene 0.005, pinene 0.005, anethol 0.006, camphoric aldehyde 0.005, cineol 0.004, methyl ortho-anido-benzoate 0.0035, terpineol 0.002, sesquiterpenes 0.0175. Per capsule: compound essence 0.025, neutral vegetable oil 0.475. It is presented in the form of gelatinous capsules designed for introducing the fluid into each nostril without risk of injury to delicate tissues. Employed in hygiene and antiseptics of the respiratory passages. Issued in boxes of 20 nasal capsules. (Wyleys Limited, Coventry.)

Neo-hydriol, Viscous.—An iodized oil of poppy-seed, containing 40 per cent of iodine, specially adapted as an opaque medium for bronchography, myelography, pyelography, etc. Dosage: 15 to 20 c.c. of the product is sufficient for most purposes. (May & Baker Ltd., Battersea, London, S.W.11.)

Nov-Umbrose.—This new X-ray shadow meal contains 75 per cent by weight of X-ray barium sulphate, rendered miscible and palatable by thorough mixture with 25 per cent of a special milk preparation. The barium sulphate is subjected to rigorous analytical control and is guaranteed to be free from impurities—particularly from soluble barium salts, which are highly toxic. Each batch of the meal is stringently examined in the laboratory before issue. Dosage: One or more packetfuls, each of which contains 2 oz. of barium sulphate. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Estroform 'B' is the benzoate of the crystalline ovarian follicular hormone; it differs from Estroform (which was introduced some months ago and of which clinical reports have appeared in the *Medical Press and Circular*, 1934, Aug. 29, 191) only in

the intensity of its effects. It is available in sterile solution standardized biologically to contain 100,000 international units per c.c., and it is suitable for use, therefore, when it is desired to administer preparations of the ovarian follicular hormone in doses of the order of 100,000 to 1,000,000 international units. (The British Drug Houses Ltd., London, N.1.)

Oleochoyrsine (Lumière) is a hydro-soluble gold and calcium salt in sulpho-organic combination (auro-thioglyceryl sulphonate) which fulfils all the essential requirements of a gold salt for therapeutic use. The action of gold is considerably enhanced by being in chemical combination with sulphur, and calcium increases toleration to gold therapy. Solubility is restricted so that absorption takes place in from 96 to 120 hours, the optimum interval between two injections: gold impregnation of the organism is therefore slow, regular, and progressive, and no aggressive action, as has been experienced with the more readily absorbed salts, follows its administration. Oleochoyrsine is indicated in tuberculosis in its various forms and particularly pulmonary tuberculosis, in rheumatisms, especially in the type known as chronic infective polyarthritis, in lupus erythematosus, psoriasis, tuberculides, and in the prevention and treatment of neurosyphilis. Leprosy and specific diseases are favourably influenced by its use, and it also appears to have some value in disseminated sclerosis. Oleochoyrsine is supplied as a suspension in oil, in ampoules of 2 c.c., in doses of 10, 20, and 30 cgrm. for administration by the intramuscular route. Commencing with 10 cgrm., and slowly increasing the dosage to 20 cgrm., and later 30 cgrm., an injection should be given every fifth day in series of from 10 to 40 injections, an interval of rest from treatment of from 1 to 2 months being allowed after each series. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

Parenamaps.—Liver extract for parenteral injection. Each 2-c.c. ampoule of extract has the clinical value of 600 grm. of fresh liver. Supplied in boxes of 6 ampoules.

Parenamaps Forte.—Concentrated extract of liver for parenteral injection. Each 2-c.c. ampoule contains the clinical activity of 10,000 grm. of fresh liver. This constitutes the so-called 'dépôt' dosage. Supplied in boxes of 6 2-c.c. ampoules. (Paines & Byrne Ltd., Perivale, Greenford.)

Paromin.—A total natural thyroid product of maximum potency. It is standardized on its calorogenic value, which is high. It is supplied in $\frac{1}{2}$ -gr. enteric coated tablets in bottles of 100. (Paines & Byrne Ltd., Perivale, Greenford.)

Pentine.—This is an 8 per cent solution of sodium pentose nucleotides, which has been found, by biological test, not to produce any toxic reaction. It is prepared for the treatment of agranulocytosis or malignant neutropenia, and other conditions in which increased production of polymorphonuclear leucocytes is desirable. Dosage: Intramuscularly, 10 c.c. daily until there is definite improvement; intravenously, 10 c.c. diluted to 100 c.c. with distilled water, daily for the first four days, in addition to the intramuscular doses. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Pepsac.—An active preparation of desiccated stomach substance which has been shown by lengthy clinical trials to be remarkably efficient in the treatment of pernicious anaemia. Pepsac is also of particular value in the prevention and treatment of subacute combined degeneration of the cord. Not only does adequate treatment with Pepsac prevent its onset, but in those patients showing cord involvement marked improvement is produced. The initial dose is 1 oz. daily. After the blood-count has been restored to normal, and if there are no neurological symptoms, this amount may be slowly reduced to the necessary maintenance dose, which varies with individual patients. Supplied in 12-oz. tins. (Boots Pure Drug Company Limited, Nottingham.)

Pepsacid (R. & B.).—Pepsin exerts its best digestive action in an acid medium. It is presented here in a dilute hydrochloric acid base, with bismuth in addition. The preparation is having success where there is slow or incomplete digestion. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Progynon has hitherto been marketed in the form of oral dragées and aqueous solution (concentration 150 mouse units). The new variety, Progynon B Oleosum, is available in strengths of 10,000, 50,000, and 100,000 mouse units (50,000, 250,000 and 500,000 international units respectively). Chemically it is the oily solution of benzoic acid ester of dihydrofollicular hormone, which is four times more active than the naturally occurring hormone.

Proluton (corpus luteum hormone) is available in boxes of three ampoules of 2 clinical units, and five ampoules of 20 clinical units.

Both Progynon B Oleosum and Proluton are administered by intrauterine injection, and in a recent report on ovarian hormone research made by Dr. Kaufmann, of Berlin, he has found that only the follicular hormone Progynon and the corpus luteum hormone Proluton are necessary to induce true menstruation in castrated women. These two products must, however, be administered in a definite dosage and in definite sequence in order to produce this effect. (Schering Ltd., 188-192, High Holborn, London, W.C.1.)

Prostatic Opocaps and Opojex.—Prostatic (B.O.C.) Opocaps (desiccated prostate gland in 3-gr. capsules) and Prostatic Opojex (prostatic gland extract in 2-c.c. ampoules) are for use in prostatic hypertrophy, results being equally successful in conditions of incontinence, frequency of micturition, and dysuria. Owing to the great benefit derived therefrom surgical interference is generally rendered unnecessary. Dosage: Opocaps, 1 t.d.s., a.c.; Opojex 1 in die (or 1 dieb. alt. when employed concurrently with 'Opocaps'). (British Organotherapy Co. Ltd., 22, Golden Square, London, W.1.)

Prostigmin Brand Peristaltic Stimulant.—Prostigmin is a powerful synthetic peristaltic stimulant, allied to the alkaloid physostigmine, but free from many of its disadvantages and much safer. Chemically it is dimethyl-carbamie ester of *m*-hydroxy-phenyl-trimethylammonium-methylsulphate, and it is supplied in boxes of 6 1-c.c. ampoules, each containing $\frac{1}{2}$ mgrm. of active substance. Prostigmin is administered by subcutaneous, intramuscular, or even intravenous injection, and is advocated in post-operative intestinal paresis, gaseous distension of the intestine, severe constipation, post-operative retention of urine, etc. It has been the subject of exhaustive clinical investigation under the control of the Therapeutic Trials Committee of the Medical Research Council, and a full report is to be found in *The Lancet*, 1934, May 5. (The Hoffmann-La Roche Chemical Works Ltd., 51, Bowes Road, London, N.13.)

Redoxon Vitamin C is pure *L*-ascorbic acid—the first of the vitamin series to be prepared synthetically. It is issued in the form of powder, in 1-grm. tubes, and 0.5-grm. oral tablets, in tubes of 20. Redoxon is intended for use in disorders due to vitamin C deficiency, defects of nutrition in childhood, during pregnancy, and convalescence, in dental and skeletal malformation, dermatoses, etc. One to three Redoxon tablets are given three times daily. (The Hoffmann-La Roche Chemical Works Ltd., 51, Bowes Road, London, N.13.)

Revitone Brand Tonic is a general metabolic stimulant presenting the therapeutic properties of strychnine, cola, phosphorus, arsenic, and manganese. The arsenic is in an organic form as 'arsylen' sodium allylarsonate. Revitone is a very palatable syrupy liquid, one or two teaspoonfuls of which are taken three times daily in a little water or other suitable vehicle. It is an excellent restorative tonic in all conditions of physical or intellectual overwork or strain, and for helping convalescence after weakening illness, surgical operations, etc. Apart from its value as a powerful stimulant and recuperative, two great points in its favour are its very pleasant taste and the fact that it does not constipate. (The Hoffmann-La Roche Chemical Works Ltd., 51, Bowes Road, London, N.13.)

Sedonan.—Consists of a 5 per cent solution of phenyldimethyl pyrazolon in anhydrous glycerin. Instilled cold into the acoustic passage it acts with marked rapidity in acute otitis media, otalgia, and other inflammatory conditions of the ear. Its favourable action in reducing pain and diminishing inflammation is due to osmosis, the anhydrous character of the solution ensuring rapid permeation of the tympanum. (H. R. Napp Ltd., 3 & 4, Clements Inn, London, W.C.2.)

Sonalgin.—Butobarbital-amidopyrin, containing soneryl gr. $1\frac{1}{2}$, and amidopyrin gr. $3\frac{1}{2}$. The combination of sedative and analgesic properties makes this a product of great value in all painful and febrile conditions, such as neuralgia, toothache, migraine, cephalalgia, influenza, dysmenorrhoea, etc. Dosage: One to two tablets three times daily. This dosage may be modified at the discretion of the doctor, but no more than six tablets should be administered during twenty-four hours. (May & Baker Ltd., Battersea, London, S.W.11.)

Streptococcus Vaccine for Ulcerative Colitis.—This vaccine has been recently prepared in the Inoculation Department of St. Mary's Hospital, London, from a particular type of streptococcus believed by Bergen, of the Mayo Clinic, to be the bacterial cause of ulcerative colitis. It may be administered in doses commencing with 200 millions, and, if there is no reaction, the dose may be increased gradually to 2000 millions at three-day intervals. The vaccine is available in 1-c.c. ampoules and in 10-c.c. and 25-c.c. rubber-capped bottles. It is supplied in the following strengths: 50, 500, and 2000 millions per c.c. (Parke, Davis & Co., 50, Beak Street, London, W.1.)

Supracort.—Concentrated extract of suprarenal cortex free from adrenalin. Each 2-c.c. ampoule contains the equivalent of 50 grm. of suprarenal cortex. Packed in boxes of 6 ampoules. (Paines & Byrne Ltd., Perivale, Greenford.)

Surgeons' Hand Soap ('Allenburys').—A really neutral, superfatted, and antiseptic liquid soap. It does not cause roughness or cracking of the skin even when used often, but leaves the skin pleasantly smooth and soft. It does not form a scum with hard water, and therefore is particularly suitable for cleaning instruments and washing the skin. It is fully equal in antiseptic power to a 1-20 solution of phenol, without the unpleasant effect of the latter. Half a teaspoonful may be worked into the hands. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Syrup Minadex enables the practitioner to prescribe *together*, in a form which enhances their therapeutic qualities and eliminates their defects, two of the most widely prescribed tonic preparations—namely, syrup ferri phosphatis co. and cod-liver oil. In one extremely pleasant preparation, Minadex combines their therapeutically active principles (iron, glycerophosphates of calcium, sodium and potassium, and vitamins A and D) with other elements—copper and manganese—the values of which have more recently been recognized. Dosage: $\frac{1}{2}$ to 2 teaspoonfuls according to age, taken twice or three times a day. (Glaxo Laboratories, 56, Osnaburgh Street, London, N.W.1.)

Takazyma.—A new antacid and starch-digestant powder, each ounce of which represents: Taka-diestase 36 $\frac{1}{2}$ gr., magnesium carbonate 72 gr., bismuth subcarbonate 42 gr., ginger 7 $\frac{1}{2}$ gr., calcium carbonate (precipitated) q.s. The usual dose is one teaspoonful suspended in water, and is suggested for use in acidity and for the treatment of gastric disturbances generally. (Parke, Davis & Co., 50, Beak Street, London, W.1.)

Tannic Acid Jelly ('Allenburys'), for the first-aid or repeated treatment of burns, is not greasy but water-soluble and therefore easily removed. It contains 5 per cent of tannic acid, 2.5 per cent of glycerin, and 0.1 per cent of acriflavine in tragacanth jelly. It does not contain boric acid or phenol, which are regarded as irritants. The use of acriflavine with tannic acid is recommended in the official *Report on the Medical Treatment of Men Burned in Colliery Explosions*. The jelly should be applied lightly and allowed to dry before it is covered with gauze. (Allen & Hanburys, Ltd., Bethnal Green, London, E.2.)

Tannic Acid Jelly (R & B).—A more convenient form of the latest burn treatment than the aqueous solution. It has the advantage also of stability in keeping and is completely non-greasy; it promotes rapid analgesia, prevents toxic absorption, and scarring is less marked. Contains as prophylactic mercuric perchloride 1-2000. Put up in tubes. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Tebeprotin is a new protein derivative of the tubercle bacillus issued in the form of a true solution and intended for use in the treatment and diagnosis of tuberculosis. The process employed in its manufacture results in the removal of the soluble endotoxins and the poisonous polysaccharide, which should not be present in a tuberculin intended for diagnostic purposes, since it gives rise to reactions of an allergic rather than of a specific character. Tebeprotin is intended to replace old tuberculin, which has been hitherto employed in the von Pirquet and Mantoux tests.

Corresponding to its superior action as a diagnostic, is its value as a therapeutic. The special advantages of this product are stated to be: (1) It is much more active than any of the existing tuberculins, and is non-toxic; the only contra-indications to its use appear to be in cases which show a septic temperature or large anatomical alterations. (2) Since it is given in the form of a true solution and not as a suspension of dead or attenuated bacilli it is rapidly absorbed by the body and any succeeding superation is prevented. (3) The constant character of Tebeprotin, since it is a chemically pure and uniform product, permits of exact dosage and guarantees a uniformity of action. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Theelin in Oil.—Theelin, the crystalline principle of the ovarian follicular hormone, is now available in oily solution in 1-c.c. ampoules, each of which represents 1000 international units. The ampoules are packed in boxes containing six. (Parke, Davis & Co., 50, Beak Street, London, W.1.)

Transfusion Solutions (Collosol).—A unique range of some thirty standard solutions is now available in the patent Collosol Transfusion Apparatus or alternatively in porcelain-stoppered bottles. A range of concentrated transfusion solutions is now also available. (The Crookes Laboratories, Park Royal, London, N.W.10.)

Tridestrin.—Standardized oestrous-producing hormone of the composition of tri-hydroxy-oestrin. This form is more active orally than keto-hydroxy-oestrin and therefore is provided for oral use in tablets containing 100 m.u. (500 int.u.) and 1000 m.u. (5000 int.u.). It is supplied in bottles of 25 and 100. (Paines & Byrne Ltd., Perivale, Greenford.)

Urazine.—Citro-salicylate of piperazine. A highly efficient remedy for the treatment of all arthritic and urinary affections. Dosage: One or two teaspoonfuls may be taken in a little water at the two principal meals of the day for eight to fifteen days. An interval of one to two weeks should be allowed and a further course given if necessary. (May & Baker Ltd., Battersea, London, S.W.11.)

Valeolina is an organic combination of the ethyl esters of the fatty acids of chaulmoogra oil (50 per cent) together with the active principles of the lipoids of cod-liver oil (20 per cent), guaiacol, thymol, and camphor in an oily medium (30 per cent). It is a powerful restorative and indicated in cases of deficient development, rickets, and tuberculous conditions, and is a most active specific for general debility. Its scientific composition is based on the most recent researches. Supplied in boxes containing 12 ampoules. Dosage: 1 ampoule daily injected deeply into gluteal muscles. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W. 1.)

Viormone.—A preparation containing the male sex hormone. Each 1-c.c. ampoule is equivalent to 75 gr. of fresh testicular substance and is standardized to contain $\frac{1}{2}$ capon unit. Packed in boxes of 6 and 12 ampoules. (Paines & Byrne Ltd., Perivale, Greenford.)

Vitamin C.—There is evidence to show that the antiscorbutic properties of fresh fruit and vegetables are due to the presence of 'hexuronic acid' first isolated by Szent-Györgyi and recently renamed ascorbic acid. The acid has been isolated from oranges, lemons, cabbages, and other vegetable sources and also from the cortex of the suprarenal gland. It has been supplied for research purposes by Messrs. Burroughs Wellcome & Co. for some time past and is now issued as 'Tabloid' Ascorbic Acid, 0.005 grm., each product being equivalent in vitamin C activity to two teaspoonfuls of freshly-expressed orange juice. This is the second pure crystalline vitamin to be issued as a 'Tabloid' product, as Vitamin D has been issued for some years, first as 'Tabloid' Irradiated Ergosterol and now as 'Tabloid' Calciferol. 'Tabloid' Ascorbic Acid should be of great value to explorers, travellers, and others who may be unable to obtain supplies of fresh fruit and vegetables. (Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.)

Vitamin C.—Pure crystalline Vitamin C (Ascorbic Acid B.D.H.) manufactured from natural sources after the method of Szent-Györgyi, of the University of Szeged, in Hungary; it is the pure vitamin that is issued in the form of tablets, each containing 5 mgrm. of pure crystalline Vitamin C (Ascorbic Acid B.D.H.), this being the equivalent of about two tablespoonfuls of fresh orange juice. Vitamin C is a specific for scurvy for persons of all ages, *The Lancet* (1934, Jan. 6, 22) reporting on the successful treatment of a case of infantile scurvy, and of a cure of scurvy in an old man by the same means (*Ibid.*, 1933, Sept. 9, 589). Vitamin C administration is recommended also for the treatment of abnormal capillary fragility (*Brit. Med. Jour.*, 1934, Feb. 3, Epit., 20); also the favourable influence on the development of premature infants and its value in gastro-intestinal disturbances in nurslings is mentioned in an abstract in the *Jour. Amer. Med. Assoc.*, 1933, Nov. 25, 1764. The issue of Vitamin C (Ascorbic Acid B.D.H.) supplements the series of the B.D.H. vitamin preparations—Avolesum (Vitamin A), Radiostol (Vitamin D), Radiostoleum (Vitamins A and D) and Radio-Malt (Vitamins A, B₁, B₂, and D). (The British Drug Houses, Ltd., Graham Street, London, N1.)

Vitamin C.—See also REDOXON.

MEDICAL AND SURGICAL APPLIANCES.

Adaptor for Diagnostic Instruments.—The Klinöstik Dual-purpose Adaptor illustrated in *Fig. 61* introduces a new improvement to battery handles for lighting ophthalmoscopes, auriscopes, and other battery-operated instruments. A mains transformer, 200–250 volts A.C., complete with cords and adaptor (provisional patent) can be applied to any battery handle, and allows standard instruments without alteration to be used direct from the domestic electricity supply and does not interfere with the using of batteries when required. A 110-volt model is made for use in the Colonies and certain other countries, and we understand that any A.C. voltage can be supplied. The transformer has a patent combined two pin and bayonet plug so that the instrument can be connected to either lamp socket or wall plug without removing any part. The price of the adaptor is 22s. 6d., or with super handle 42s. 6d. (John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2.). It can be had from all Surgical Instrument Makers.

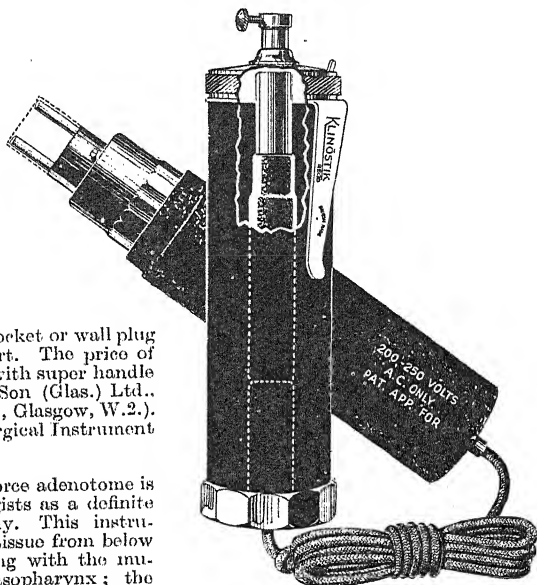


Fig. 61.

Adenotome.—The La Force adenotome is considered by many otologists as a definite advance in adenoidectomy. This instrument engages the adenoid tissue from below upwards without interfering with the mucous membrane of the nasopharynx; the blade is kept away from the mucosa by the difference in the level of the blade and the sides of the box. The adenotome does not

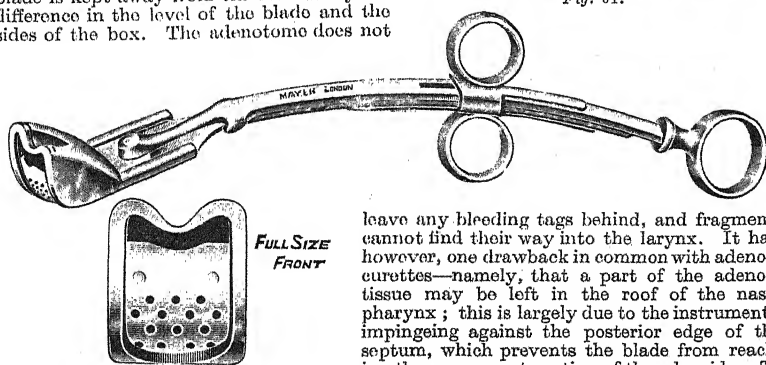


Fig. 62.

leave any bleeding tags behind, and fragments cannot find their way into the larynx. It has, however, one drawback in common with adenoid curettes—namely, that a part of the adenoid tissue may be left in the roof of the nasopharynx; this is largely due to the instrument's impinging against the posterior edge of the septum, which prevents the blade from reaching the uppermost portion of the adenoids. To remedy this defect, Mr. Arthur Miller, F.R.C.S., Edinburgh, has modified the instrument by

having a recess in the box and blade which permits the adenotome, when introduced, to lie snugly against the posterior edge of the septum; when closed the blade just protrudes through the recess of the box (*Fig. 62*). The following advantages are claimed: (1) The recess permits the surgeon to be certain that the adenotome, when lying against the septum is also strictly in the middle line of the nasopharynx, thus avoiding the risk

of injuring the Eustachian cushions. (2) The uppermost portion of the adenoid tissue is not left behind, as the recess allows the blade to sever the 'root' of the adenoids. (Mayer & Phelps Ltd., 59-61, New Cavendish Street, London, W.1.)

Anglepoise Lamp.—A revolutionary invention giving perfect and localized illumination (*Fig. 63*). Designed on an entirely new principle, it is adjustable to any position but at the same time will remain stationary and stable in any position. Eye-strain is eliminated by the use of a low-power bulb and the design of the lamp which allows concentrated, reflected, or diffused light to be obtained at will. It is invaluable for consulting rooms, hospital wards, operation theatres, dental clinics, etc. Made entirely of steel, high-class finish, it is available in three models for standing on a table, for wall mounting, or on stand with easy running castors. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

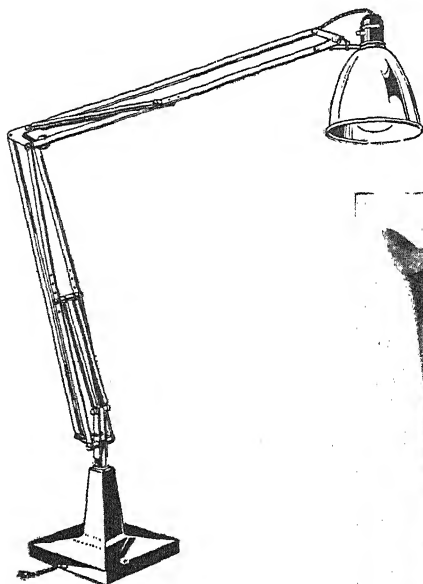


Fig. 63.

Artificial Limb.—The appliance here illustrated (*Fig. 64*) is of an entirely new design obviating all the troubles usually associated with Syme's amputations. A leather socket is moulded to an accurately rectified cast of the stump which ensures a glove-like fit, and effectively prevents movement and friction. This socket is opened and closed at the back with a zipp fastener which allows quick and easy entry for the stump. The socket fits into the seamless metal shin which has a thin stainless steel cup, forming the end bearing. The fastenings are quick and simple, and so firm that once the limb is on it cannot be pulled off. This method of fitting enables the weight of the body to be equally shared between the bearing points below the knee and at the end of the stump. It will be realized that the proportion can be varied to suit any particular stump. This limb is fitted with the patented cushion-joint foot which makes possible an ankle-joint of exceptionally neat appearance. (Desoutter Bros. Ltd., 73, Baker Street, London, W.1.)

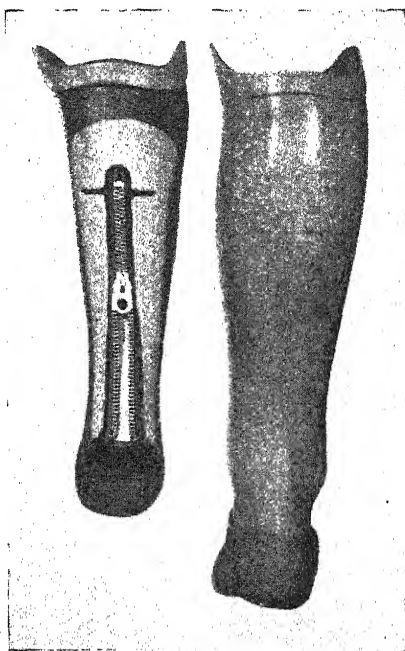


Fig. 64.

Aspiration Syringe.—Designed by Dr. B. W. Armstrong, of Margate, for the aspiration of cold abscesses (*Fig. 65*). It consists of a cannula made of thin-walled stainless steel barrel with a heavily milled mount, which fits the nozzle of a 20-c.c. Gauvain's syringe. The point has a rather short bevel, and a groove in the milled mount serves to indicate the position of the bevel when the point is not visible. A pilot with a

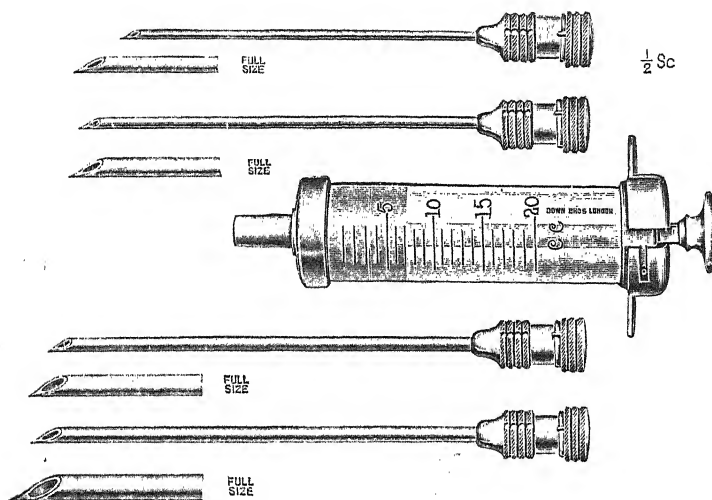


Fig. 65.

similarly bevelled point accurately fits the barrel of the cannula and is also provided with a head with three rows of milling, which renders it easily grasped for the purpose of withdrawing it after the introduction of the needle into the abscess, which is performed under local or nitrous oxide anaesthesia. The needles are made in four sizes. (Messrs. Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

Auriscope and Ophthalmoscope.—The increasing demand for a cheap but really efficient electric auriscope and ophthalmoscope has induced John Smith & Son (Glas.) Ltd., of 28, Gibson Street, Hillhead, Glasgow, to market a 'Minor' Auriscope with

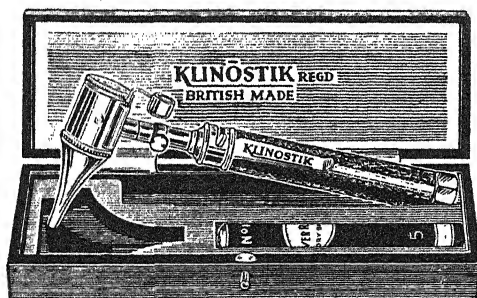


Fig. 66.

daylight bulb at the low price of 27s. 6d., or complete in case with spare battery, 32s. 6d. The auriscope (*Fig. 66*) is similar in every way to standard auriscopes and takes standard specula. The back lens is removable, to admit the passage of instruments

through the speculum, the small hinged side lens then being brought into position. The lenses focus beyond the tip of the speculum, so that when the patient is being examined the membrana tympani is correctly in focus. The 'Minor' ophthalmoscope in case at 47s. 6d. is the latest type 'May' with twenty-four lenses which permit the



Fig. 67.

fundus and media of any eye to be minutely examined (Fig. 67). The handles are fitted with a rheostat to control the intensity of the light, and take the popular pen torch batteries. A 'Minor' Combination Set which includes the auriscope and ophthalmoscope can also be supplied in a case with extra speculum, tongue depressor, and spare bulb for 75s., and can be had from all Surgical Instrument Makers.

Bed-cradle (Folding).—The usual bed-cradle is a cumbersome article, and difficult to store when not in use. This model has been designed to overcome these difficulties, as it can be folded flat and easily stored.

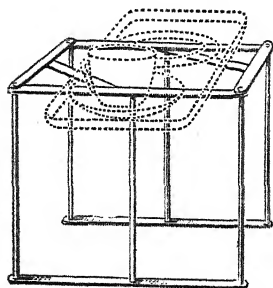


Fig. 68.

The cradle is held firmly open when in use by means of two cross-members which give the open cradle complete rigidity. Having a flat top it can in many cases be used as a bed-table (Fig. 68). It is made in four standard sizes: for one knee, one leg, both legs, and for body. Constructed of mild steel bars and finished with aluminium cellulose varnish. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

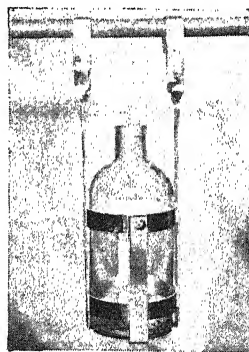


Fig. 69.

Bedside Drainer (Morison).—This is a chromium-plated holder for hanging to the tubular rail of the bedstead carrying a wide-mouthed bottle of the 'Winchester' size (Fig. 69), and is invaluable for use in colostomy and suprapubic drainage. It hangs well off the floor, is screened by the counterpane, and eliminates vessels being put on the floor at the risk of being upset. The hangers are so designed that the bottle can be readily removed from the holder *in situ* for cleansing. Smaller frames or holders have also been designed for wall-fixing, etc., to carry containers, vacuum bottles, etc. Particulars from Robert Morison, M.R.San.I., 11, Lauriston Place, Edinburgh. Supplied by Messrs. Arch. Young & Son Ltd., Forrest Road, Edinburgh.

Bowl (Raise-and-Lower). The furniture in an operating theatre is apt to be provided with a fixed pipe, but this means a certain amount of discomfort to the surgeon who occasionally operates in the sitting position. It is therefore a convenience to have such intimate articles as solution bowls made in such a fashion that they can be simply adjusted to the required level. *Fig. 70* shows a bowl which has been installed in the operating theatre of Moorfields Eye Hospital; a glance at the design will show that it amply meets the above criticism. (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

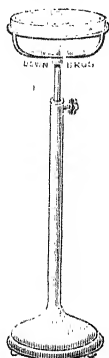


Fig. 70.

Cabinet and Table (Combined).—Chromium-plated steel frame on rubber-tyred castors, clear plate-glass cabinet, solid mahogany drawer with black glass top and shelf below (*Fig. 71*). Size of cabinet $22 \times 20 \times 8$ in., size of table 20×20 in.; total height, 62 in. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, Holborn Circus, London, E.C.1.)

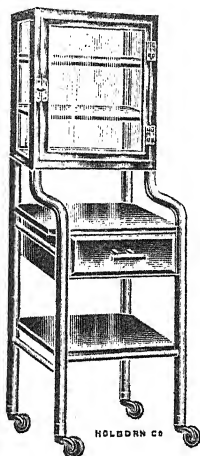


Fig. 71.

Chloroform Inhaler (Christie Brown's).—A new and safe method for self-administration of chloroform by the patient in maternity cases during labour. It consists of a cylindrical metal container, both ends of which are cone-shaped (*Fig. 72*). A small hole at the base of each cone is provided, the upper one acting as an air intake, thus producing a suitable mixture. A small silk bag is supplied to cover the inhaler when in use. To fill the inhaler, hold on one side, and pour the chloroform in

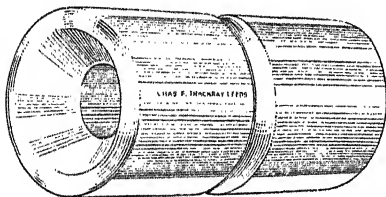


Fig. 72.

until it runs out from the bottom (the capacity is approximately 2 drachms). It is then placed in the silk bag, and the patient is instructed to hold it in one hand, and apply one end to her nostrils. When the inhaler is not in use, or being carried about, the ends can be closed by means of ordinary dispensing corks. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

the prepuce. It is easily adjusted so that the correct oblique cut can be made. The price is 1s. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, Holborn Circus, London, E.C.1.)

Circumcision Clip.—For use instead of

the circumcision shield to protect the glans

when removing the redundant portion of

CLAMPS.

Beney's Clamp is a very efficient instrument for controlling hemorrhage in tonsil dissection, and with the object of

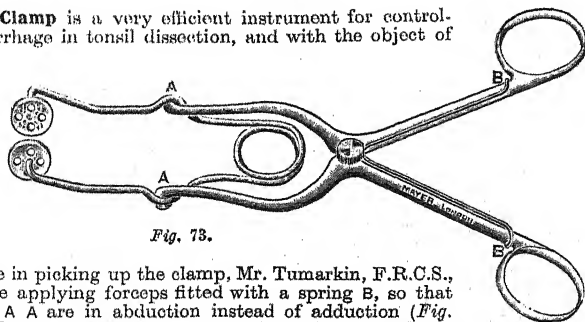


Fig. 73.

saving time in picking up the clamp, Mr. Tumarkin, F.R.C.S., has had the applying forceps fitted with a spring B, so that the points A are in abduction instead of adduction (*Fig. 73*). The clamp is thus firmly gripped in the forceps and can be picked up and applied in a moment. (Mayer & Phelps Ltd., 59-61, New Cavendish Street, London, W.1.)

The Furniss Clamp for Intestinal Anastomosis is an ingenious accessory, and it greatly facilitates the surgeon's work when performing internal operations comprising end-to-end or side-to-side anastomosis. The instrument is made of stainless steel, and has been well reported on by several leading surgeons. An interesting leaflet about the clamp and technique for use is issued by the Medical Supply Association Ltd., 167-173, Gray's Inn Road, London, W.C.1.

Nephrectomy Clamp.—In the operation of nephrectomy it is sometimes found that the clamp slips off the pedicle after the kidney has been removed. With a view to avoiding this accident, which may be serious, Mr. W. K. Irwin, F.R.C.S., has designed the instrument shown in *Fig. 74*. It is made somewhat on the pattern of Thomson-

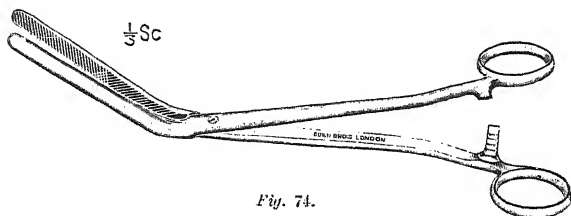


Fig. 74.

Walker's renal pedicle forceps. The crushing surfaces of the instrument bear chevron-like serrations, which grip the part firmly, and at the same time tend to prevent transverse spreading of the pedicle. The jaws are 3 in. long and the shanks $6\frac{1}{2}$ in. long. (Down Bros., St. Thomas's Street, London, S.E.1.)

Clamp for Stomach or Intestine.—*Fig. 75* shows a new clamp designed by T. H. Somervell, F.R.C.S., which he has used with great satisfaction on over 200 operations on the stomach as well as many on the intestines. The clamp holds the gut firmly, yet gently and with uniform pressure. It can be made of stainless steel throughout and is easy to clean. The pivoted blade should be enclosed in rubber tubing, and if

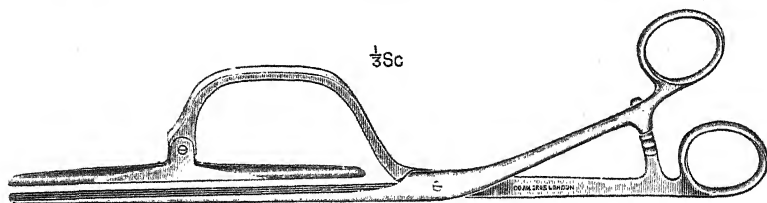


Fig. 75.

that is done this clamp causes the minimum of damage to the mucosa of stomach or intestine. It is 'easier to be gentle' with this clamp than with Wells's, Kocher's, Beck's, or any other type. The bent handles enable two clamps to be used side by side without undue pulling of the gut, besides allowing them to be removed independently with ease. (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

Clover's Crutch.—Dr. Burt has suggested this form of Clover's crutch (*Fig. 76*), with the idea of making it more portable. It folds into a small space and being made

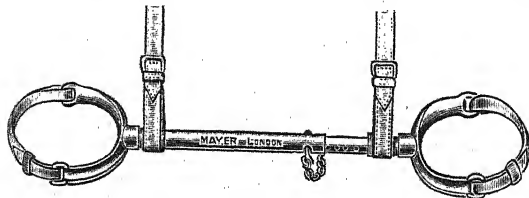


Fig. 76.

of aluminium alloy is very light, weighing under 1 lb. (Mayer & Phelps Ltd. 59-61, New Cavendish Street, London, W.1.)

Consulting-Room Couch to match modern style tubular steel furniture, frame chromium-plated, top well-sprung upholstery covered in real hide or rexine, with

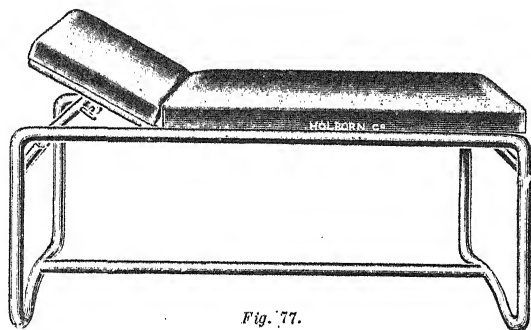


Fig. 77.

adjustable head-piece (Fig. 77). Size 72 x 26 x 33 in. high. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, Holborn Circus, London, E.C.1.)

Crutch (All-metal).—This new all-metal crutch weighs 1 lb. per pair less than any other full length crutch on the market. It consists of one metal upright, a light metal head covered with sponge rubber under leather, and a cycle-grip handle. It is sold at £2 2s. per pair. (M. Masters & Sons Ltd., 240, New Kent Road, London, S.E.1.)

Developer.—‘Tabloid’ Fine-grain Developer is specially intended for the production of fine-grain negatives. It may be used for miniature or other films or plates which it is desired to enlarge to a considerable degree. Its use does not demand increased exposure or increased development, and it gives negatives free from fault or chemical blemish even when used with the fastest of fine-grain films. It is prepared from ingredients of exceptional purity, a point of great importance in miniature negative work. Dissolved in plain water, it is a most satisfactory fine-grain developer for negatives designed to be enlarged up to about 10 diameters (V.P.K. to 20 x 15 in. approx.), and has this further advantage, that if a 20 per cent solution of anhydrous sodium sulphite is used, instead of part of the water, the grain is still finer and permits of much greater degrees of enlargement. A time-table is given of correct times for developing different films at different temperatures. Factors for factorial development are also given on the cartons, so that development to the correct degree of contrast is rendered simple. The developer is issued in cartons each containing materials sufficient for preparing 30 oz. of normal strength developer, or 60 oz. of tank developer. (Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.)

Diagnostic Sets.—Fig. 78 shows the latest improved Klinöstik Diagnostic set, which is supplied with the new *Dual-purpose Handle* in addition to the usual instruments; it has the advantage that with this handle the instruments, though fitted with the standard instrument 2.5 volt bulbs, can be used either with batteries or from the domestic electricity supply, 200–250 volt A.C. The Set consists of May electric ophthalmoscope, auriscope with three specula, expanding nasal speculum, curved laryngeal rod with lamp, throat mirror, post-nasal mirror, tongue depressors, focusing swivel head-lamp, and spare lamps. The price, complete with dual-purpose handle in velvet-lined case, is £7 8s. 6d., and can be had from all Surgical Instrument Makers. The makers are John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2.)

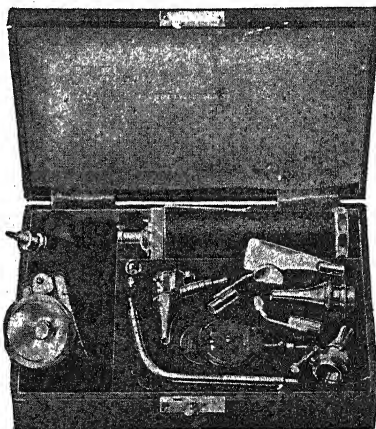


Fig. 78.

Another attractive diagnostic set in 'attaché case' style has just been added to the Klinöstik range (Fig. 79). It is one of the most complete sets on the market and contains: May electric ophthalmoscope, auriscope with three specula, dilating nasal speculum, angled laryngeal rod with lamp, throat mirror, post-nasal mirror, focusing swivel head-light, rubber inflation bulb, spare lamps, and the latest types electric protoscope and electric bi-valve vaginroscope. The serviceable carrying case measures $13 \times 11 \times 2\frac{1}{2}$ in., and the price is £10 15s. A *Dual-purpose Handle* to allow the Set to be operated from both batteries and domestic electricity supply (A.C.) can be added for 22s. 6d. extra. The makers are John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2., and it can be had from all Surgical Instrument Houses.



Fig. 79.

Diathermy Apparatus Attachment.—Surgeons and institutions possessing an ordinary diathermy apparatus sometimes require diathermy for Safar's operation for detached retina, and find that the tube of the standard machine for surgical work

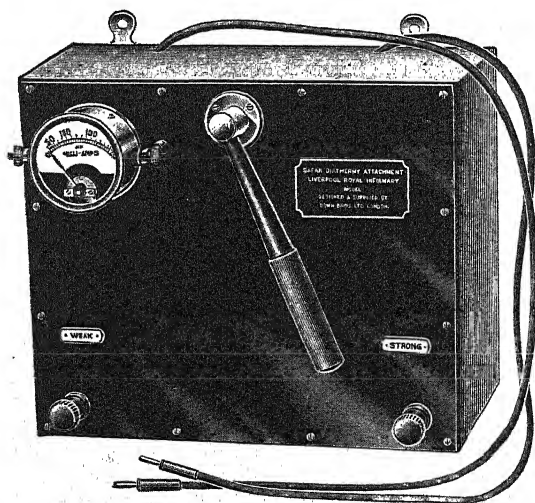


Fig. 80.

is too heavy. Fig. 80 shows an attachment which can be put on to any ordinary diathermy machine and render it suitable and controllable for Safar's operation. The apparatus was made by Messrs. Down Bros. Ltd., for Liverpool Royal Infirmary.

Drainage Bag for Permanent Cystotomy.—The apparatus shown in *Fig. 81*, which was suggested by Mr. Terence Millin, F.R.C.S., is designed to alleviate the lot of the patient condemned to a permanent cystotomy, and has given much satisfaction. The discomfort of a bag 'flapping' against the leg while walking is avoided. The emptying of the bag can be carried out quite simply in a public lavatory through the usual exitus from the trousers. The capacity of the bag is 20 oz., but it is preferable to empty it when containing between 8 and 10 ounces. Its inlet is provided with a valve, preventing regurgitation from the container to the bladder. The theoretical object of 'uphill drainage' has not been substantiated in practice. It is, of course, all-important for the satisfactory functioning of any cystotomy that the fistula should be made sufficiently remote from the symphysis pubis. The author's description appeared in the *Brit. Med. Jour.*, Nov. 24, 1934. The makers are Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.

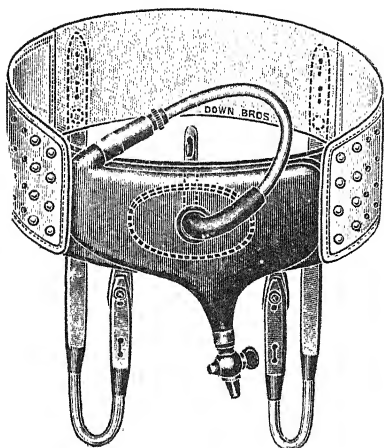


Fig. 81.

Drop-counter (Henning's).—This now drop-cock (*Fig. 82*) obviates the defects of those already in use for rectal and intravenous infusion. It consists of a cone operated by a screw which alters the amount of the flowing liquid. At the free end of the cone is attached a finger which gives on the gauged scale the passing through speed in number of drops per

minute. The gauge gives readings of 1, 2, 4, 6, 8, 10, 12, which stand for 10, 20, 40, 60, 80, 100, and 120 drops per minute. The thread of the screw operating the cone is chosen in such a manner that the readings on the gauge are sufficiently large. The cock is closed when the finger points to 0. Price, 17s. 6d. net. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

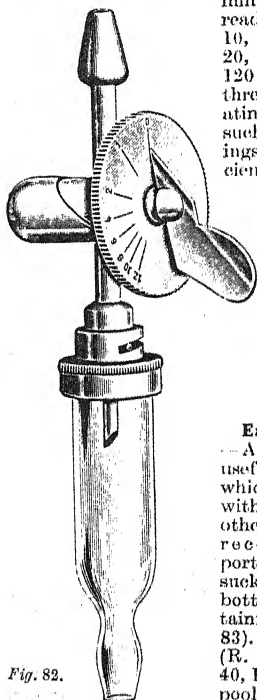


Fig. 82.

Ear Syringe (The 'Eta').

—A new and extremely useful type of ear syringe which the operator can use with one hand, whilst the other is free to hold the receiver. The rubber portion is fitted with a sucker which holds to the bottom of the vessel containing the solutions (*Fig. 83*). Price, 9s. 6d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

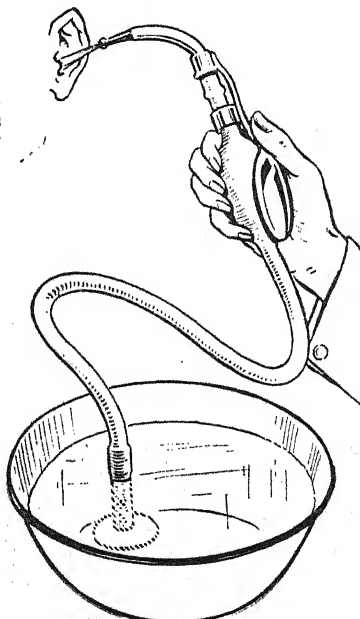


Fig. 83.

Enterotome (Devine's).—This instrument (*Fig. 84*) is for closing colostomy openings. It is used by Mr. Milligan and at St. Mark's Hospital. The blades are wide, to prevent

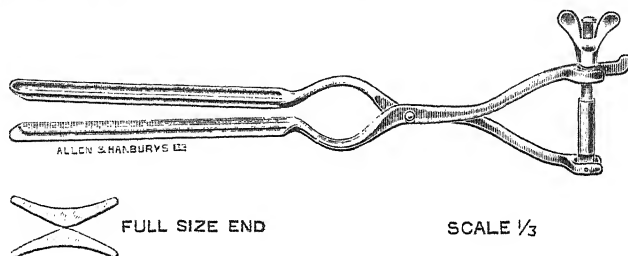


Fig. 84.

cutting, and have a narrow compression surface, the tension of which can be adjusted as desired by means of the screw. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Extension Pulley.—The new 'Universal' Extension Pulley has been designed to facilitate the technique of applying extension to the limbs. The usual type of apparatus at present in use requires clamping on the foot of the bed, the size and shape of which vary considerably. Also damage to the enamel of the bed cannot be avoided. With the 'Universal' Extension Pulley these disadvantages are entirely overcome as the

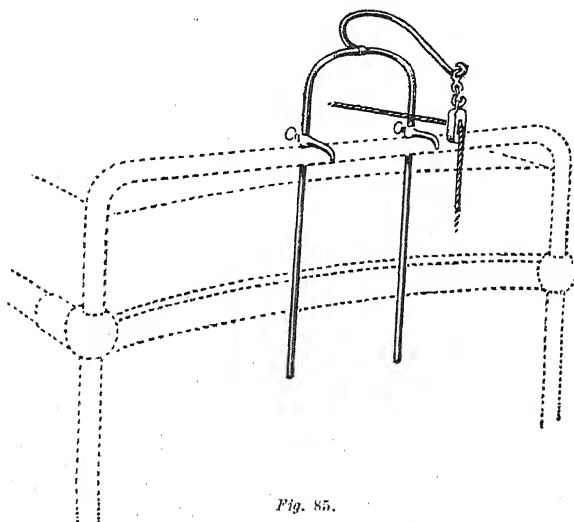
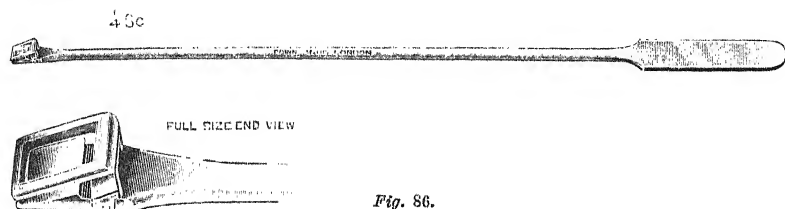


Fig. 85.

apparatus can be applied to the foot end of any hospital bed in a few seconds. There are no clamps to fix, as the downward pull of the extension weights holds the pulley firmly in position (*Fig. 85*). The apparatus is strongly constructed of solid steel rod with welded joints finished in aluminium cellulose varnish. Descriptive circular on application to the manufacturers. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Fascia Lata Strip Cutter.—The instrument designed by Dr. H. A. D. Small and illustrated in *Fig. 86* can, with the greatest simplicity, remove a strip of fascia lata as regular as a piece of tape, and from 10 to 11 in. long, through an incision 2 to 2½ in. long at the lower end of the thigh and a tenotomy puncture at the upper end. The principle can be best understood by reference to the instrument. A vertical incision

2 to 2½ in. long is made over the anterior edge of the ilio-tibial band—its lower end being at the level of the upper border of the patella. A tongue of fascia is freed from



the underlying tissues and turned upwards. It is about 0.4 in. in width. The free end of this is fed through the slot and aperture in the instrument and is then firmly grasped by a pair of Kocher's forceps. The left hand keeps a gentle traction on this while the right pushes the instrument upwards. The upper surface pushes up the subcutaneous tissues while the lower pushes away the underlying tissues, one being above and the other below the fascial layer, while the two vertical blades cut a strip from the fascia. When resistance is met with by the head striking the adherent fibres of tensor fasciae femoris (from 10 to 11 in. up) the strip is freed at the top by a subcutaneous tenotome, or by a tiny incision if the patient is very fat, and the strip drawn down. The description reads as rather complicated but actually the operation is simplicity itself. The makers are Down Bros. Ltd., St. Thomas's Street, London, S.E. 1.

Fasciotome (Patey's).—This instrument was devised by Mr. D. H. Patey, of the Middlesex Hospital, for use in conjunction with Rowlands' fasciotome. The Rowlands'

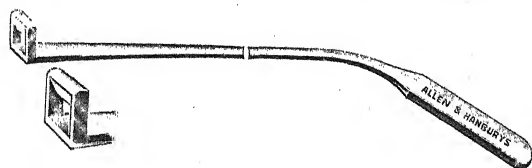


Fig. 87.

instrument is used for cutting the fascia lata lengthwise, and the Patey's instrument (Fig. 87) for cutting across the fascia, thus obviating the making of a second incision. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

'Fingerlite'. The outfit shown in Fig. 88 has been designed by Mr. Roland Williams primarily to facilitate the examination of the eye by oblique illumination. The light can be focused to the intensity desired by sliding the lens backwards or forwards. It will be observed that by thus using the 'Fingerlite' instead of a condensing lens

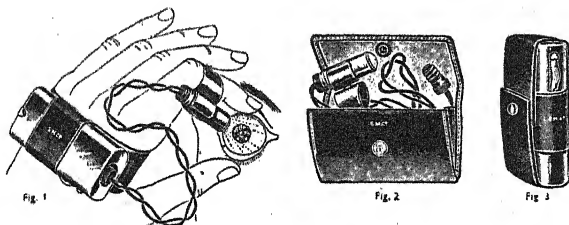


Fig. 88.

or a pocket torch, the finger and thumb of the same hand are left free to steady the patient's head and retract the eyelids. The utility of this arrangement is obvious when minor operations (such as removing foreign bodies from the eye) have to be done without assistance.

The apparatus is also very serviceable when worn on the distal joint of the thumb and using a Kramer's nasal speculum; a good view of the interior of the nose can be

obtained with it; while it can also be used with a vaginal speculum, rectal speculum, and with a tongue depressor. The battery is held on the back of the hand by means of a rubber strap. (The Surgical Manufacturing Co. Ltd., 83-85, Mortimer Street, London, W.1.)

FORCEPS.

Calculus Forceps.—The instrument shown in *Fig. 89* has been devised by Mr. Charleson, F.R.C.S., Perth Royal Infirmary, to overcome the difficulty of removing calculi from the bile-duct and ureters. An outer sheath similar to a Mayo's gall-stone probe encloses a fine wire, terminating in three claws. An opening is made in the duct,

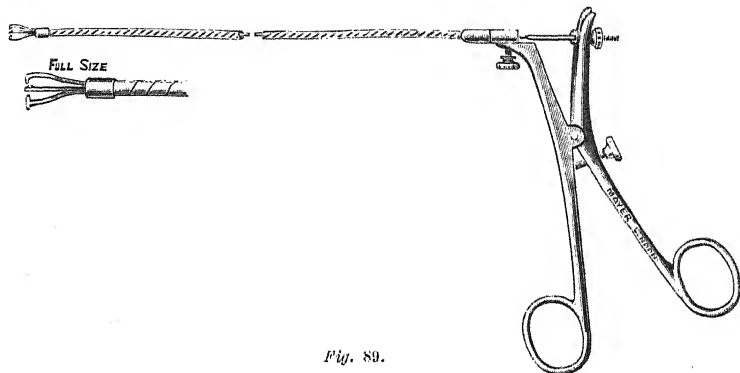


Fig. 89.

and with the jaws closed forming a probe the instrument is passed in until it impinges on the stone. The jaws are then opened, this action synchronizing with their advancing to grip the stone. They open sufficiently to grip strongly anything up to the size of a large pea, causing the minimum of trauma to the mucosa of the duct. (Mayer & Phelps Ltd., 59-61, New Cavendish Street; London, W.1.)

Cervical Biopsy Punch Forceps.—Dr. R. H. Nattrass, Resident Surgical Officer at St. Mary's Hospital, Manchester, has had made the cervical biopsy punch forceps for removal of tissue from the cervix uteri (*Fig. 90*). By means of the male and female

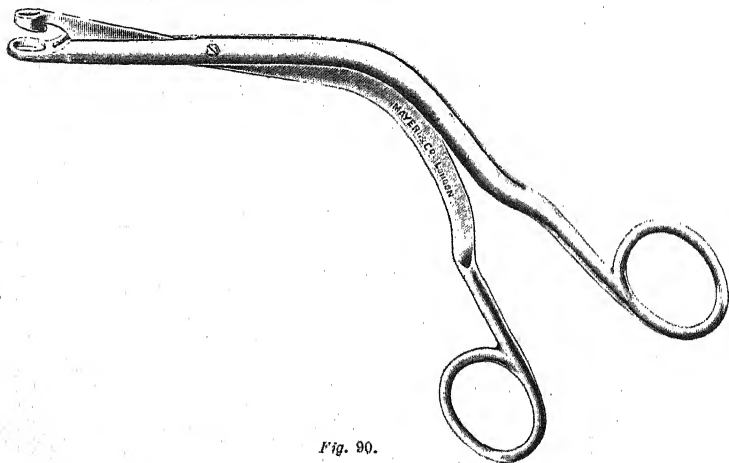


Fig. 90.

blades a piece of the cervix large enough for microscopy is completely excised with clear cut edges and very little hemorrhage. (Mayer & Phelps Ltd., 59-61, New Cavendish Street, London, W.1.)

Frankenfeld's Universal Forceps or Snare.—For applying diathermy to growths in the rectum. With this instrument (*Fig. 91*), the growth can either be lightly held

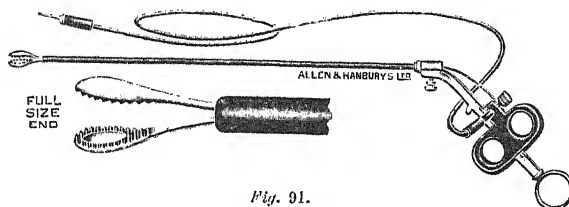


Fig. 91.

with the jaws of the forceps, or a snare wire can be used and diathermy current applied. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

Neon Reynolds Forceps and Uterine Pipe.—For testing the patency of the Fallopian tubes. The instrument (*Fig. 92*) consists of two pairs of vulsellum forceps for gripping each side of the cervix, joined together with ball-and-socket joints. The position of

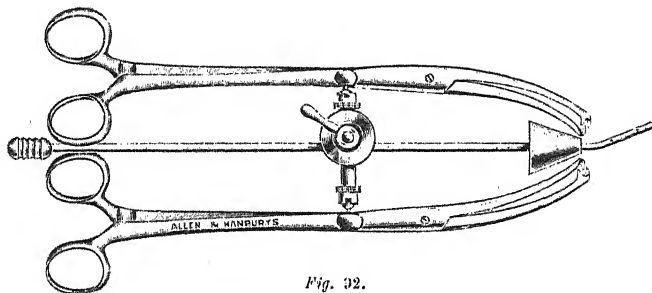


Fig. 92.

the uterine pipe is adjustable and easily fixed by the clamping screw. By its aid the examination can be carried out without an assistant, as the pipe is securely held in position by the forceps. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

Peritonsillar Abscess Forceps.—These forceps (*Fig. 93*) are made with a curve two-thirds down the shanks, so that the field of operation is not concealed by the operator's

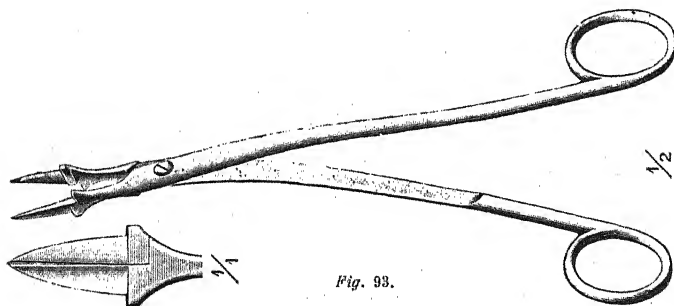


Fig. 93.

hand. The head is spear-pointed and divided, each half continuous on to the shanks. Price, 11s. 6d. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

Pyelo-lithotomy Forceps.—Mr. W. K. Irwin, F.R.C.S., has designed a new model of pyelo-lithotomy forceps (*Fig. 94*). The instrument is obtainable from Messrs. Down Bros., St. Thomas's Street, S.E.1.

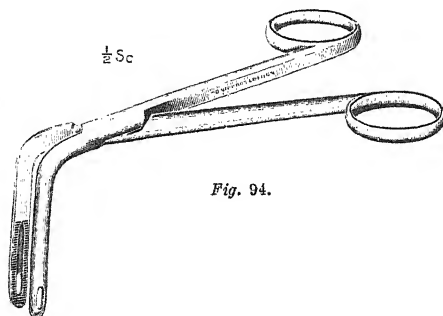


Fig. 94.

Gas-air Apparatus (Minnitt's).—Dr. R. J. Minnitt, of Liverpool, has devised an apparatus for the self-administration of gas-air analgesia for the midwifery of general practice. There are two models made, one in a carrying case as a portable model (weight about 15 lb.), the other on an aluminium stand for hospital use. A full account of the technique appeared in *The Lancet*, 1934, June 16, 1278. (A. Charles King Ltd., 34, Devonshire Street, London, W.1.)

Head-lamp.—The 'Davyon' Aural Head-lamp (*Fig. 95*) is a new appliance suggested by Mr. B. H. Pidcock, F.R.C.S. The optical system projects a circle of light $\frac{1}{2}$ in. in diameter at a distance of approximately 1 ft. without showing any image of the filament. The light being concentrated at the end of an aural speculum, a brilliant illumination of the drum is obtained, and there is no confusing light from outside. It is mounted on an adjustable aluminium headband with 'Sorbo' pads for comfort. It costs £3 3s. with a spare 4-volt gas-filled bulb, and is made by Messrs. F. Davidson & Co., 143-149, Great Portland Street, London, W.1.

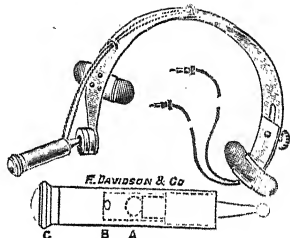


Fig. 95.

Headlight.—The new Twin-service Winchester Headlight (*Fig. 96*) makes possible the placing of a flood of light right where it is needed, following with every move of the head, and at the same time leaving both hands free. The lens can be tilted up or down to throw the light fully on the object or space to be illuminated, and the two reflectors supplied allow either focusing or diffuse type of light

at will—with the diffusing reflector the lamp does not throw any image of the filament, just a clear circle without shadows. It is simple to use, light in weight, comfortable to wear. *Fig. 97* shows the headlight ready for use as a portable lamp which can

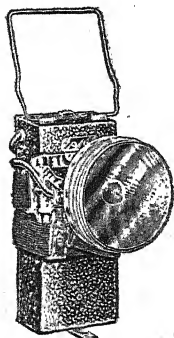


Fig. 97.

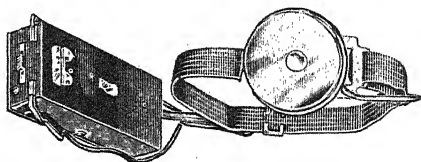


Fig. 96.

stand anywhere or be carried in the hand. The twin service headlight is beautifully finished in black and chrome, priced at 17s. 6d. complete with three standard unit flashlight cells, and is obtainable from all Surgical Instrument Makers. (John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2.)

Head-rests for Cranial Surgery.—These fixtures for cranial or spinal operations designed by Professor A. K. Henry, of Cairo, are adapted for use with an operation table ordinarily used for general surgery (*Fig. 98*). The 'face-down' fixture for cranial operations in the face-down position eliminates neck length as a cramping factor by supporting the patient's shoulders at points beyond the end of the table; his face lies then still further off, and gives the anaesthetist full access to the mouth and nose. Also it can be easily adapted to all patients whether infants or the largest men. The 'face-up' fixture is used for frontal and parieto-temporal craniectomy. For frontal exposures the head lies face up as it does for ventriculography. In the

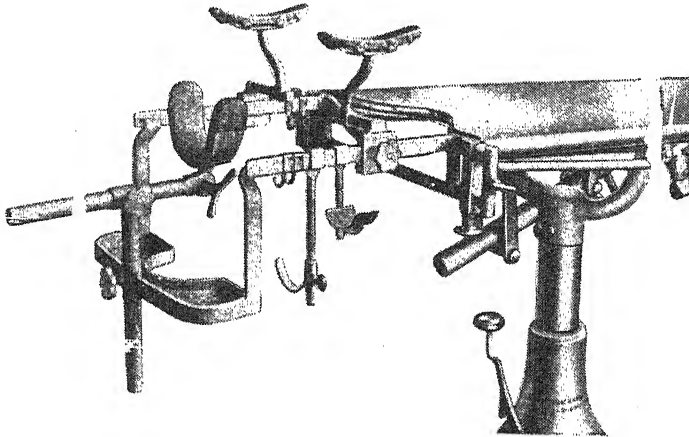


Fig. 98.

case of a wide parieto-temporal approach one crescentic support is adjusted beneath the head to the occiput; the other, set nearly at right angles to the first, passes obliquely above and close behind the ear, supporting the parieto-occipital region on the side opposite the field of operation. The pivotal points of the two supports should be kept close together when adjusting them for this exposure. Descriptive circular on application to Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.

Holder-punch.—During the operation of nailing the fractured femoral neck by the Smith-Petersen method, it is sometimes difficult to introduce the nail in the desired direction on account of the propinquity of the large flap, the shortness of the nail, and the obscuring of the nail by holding forceps or by the hand. To overcome this difficulty Mr. R. I. Stirling, F.R.C.S., has devised the holder-punch shown in *Fig. 99*. It consists of a rod of stainless steel, about 8 in. long. One end of the rod has been drilled

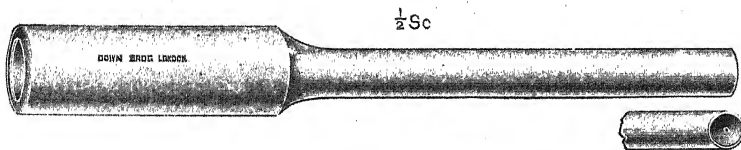


Fig. 99.

to a depth of $1\frac{1}{2}$ in. Into this drilled hole the head and upper part of the Smith-Petersen nail can be placed, leaving an adequate length of the sharp end of the nail protruding. The nail is held snugly in position and the direction it will take in the femoral neck and head can be easily regulated by altering the angle at which the holder-punch is held. The hand grasping the holder-punch is well away from the site of introduction, which is clearly seen.

After the outer cortex has been perforated by Smith-Petersen's special instrument, the sharp end of the nail is applied to the desired place of entrance. Then by hammering the other end of the holder-punch the nail can be driven into the bone in the desired

direction sufficiently far to guarantee that subsequent hammering will not alter the line it is taking. When the nail has been driven in till the holder-punch impinges against the outer surface of the femur, the holder-punch is pulled off the nail and is reversed, so that the smaller end, which is hollowed out as a punch, can be placed over the protruding head of the nail. By hammering the hollow end of the holder-punch the nail can then be driven home. The Smith-Petersen impactor is used as requisite in the normal way. The use of this instrument not only ensures a 'first-time' correct introduction of the nail, but also allows the nail to be driven in under full vision and minimizes the handling of tissues. The makers suggest that a bakelite rubber or boxwood hammer should be used instead of a metal hammer, which might damage the ends of the holder-punch.

The holder-punch and standardized Broomhead-Smith-Petersen nails, of an improved make, are constructed by Messrs. Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.

Hot-water Bottle Cover (The Improved 'Charlotte').—As will be seen from *Fig. 100* the cover, with the aid of a zip fastener, completely encloses the bottle, thus avoiding all risk of burns from the stopper. The advantage of this fastener over press studs will be readily appreciated as that portion of the bottle can be easily opened to fill or empty the bottle. It is supplied in pink, light blue, dark blue, and orange corduroy. (C. J. Hewlett & Son Ltd., 35-42, Charlotte Street, London, E.C.2.)

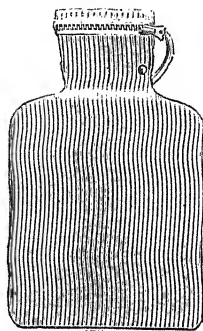


Fig. 100.

Hypodermic Outfit.—A compact, convenient, hypodermic outfit is practically essential in general practice. Allen & Hanburys Ltd. have produced a neat little case which is constructed to carry in a small compass all the materials which the general practitioner is likely to need for hypodermic medication. The case is fitted with the following articles: (1) A Record syringe (1 c.c. or 20 min.) fitted into a spirit-proof container behind the hinge of the lid. (2) Three extra needles, also in the spirit-proof

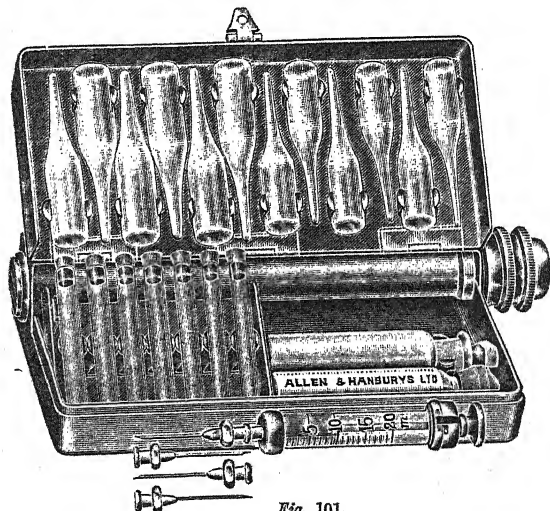


Fig. 101.

container. (3) Clips inside the case for 12 ampoules and for 7 tubes of Hypoderms (hypodermic tablets), and made to take ampoules and tubes of varying sizes. (4) A file. (5) A stoppered bottle (empty) intended for spirit. (6) A 5-c.c. vial of 'Apyrogen' distilled water. (*Fig. 101.*)

The price of the complete outfit as above is 32s. 6d., without ampoules or 'Hypoderms'. Ampoules and 'Hypoderms' can be supplied, in accordance with individual requirements, at an extra charge. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Infra-red Ray Generator (The Grosvenor).—This new unit has been produced after much experimental work and is said to be an improvement on older models. Adjustability, stability, low current consumption, and deep penetrative effects are some of the advantages claimed. (The Medical Supply Association Ltd., 167-173, Gray's Inn Road, London, W.C.1.)

Inhaler (Gusterson's).—This inhaler (*Fig. 102*) is a larger edition of that devised by Mr. Denis Browne some years ago, and used at the Children's Hospital, Great Ormond Street. It is large enough for adults and has two perforated tubes through which can be introduced oxygen, N_2O , or CO_2 . The outside connections act as finger rests, and

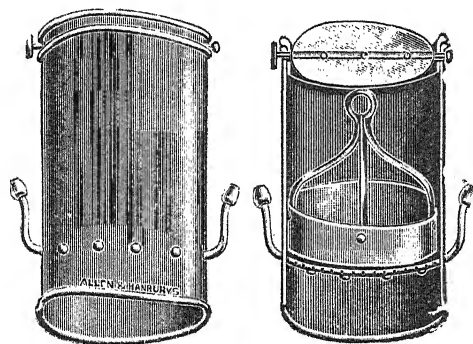


Fig. 102.

enable the inhaler to be held comfortably in one hand. Gauze is wrapped round the internal frame on to which ether is dropped. The rotating cover increases or decreases the percentage of ether vapour as desired. (Allen & Hanbury's Ltd., Bethnal Green, E.2.)

Mastoid Retractor.—The instrument illustrated in *Fig. 103*, designed by Mr. Reginald H. Smith, D.L.O. (Manchester), has been found most useful in practice. The two blades carry five teeth each. Three are for the main or central part of the incision, and the two shorter ones, fitting in the lower part of the incision, are carried on the terminal part of the blade, which is curved inwards. This inward curving of the blades, together with the fact that only three teeth are used for the central part of the incision, prevents the lower end of the incision being stretched and drawn upwards.

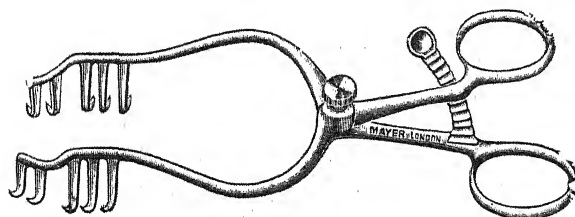


Fig. 103.

The instrument is designed with the object of attaining a more satisfactory and adequate exposure of the mastoid cortex—especially the tip, which frequently offers difficulties when instrumental manipulations have to be made. It has the further advantage of holding itself very securely on the wound, and has no tendency to 'jump out' while the operation is in progress. It thus gives easy access to the field of work. (Mayer & Phelps Ltd., 59-61, New Cavendish Street, London, W.1.)

Mouth-gag and Cheek Retractor (Combined).—The gag shown in *Fig. 104* has been designed by Mr. T. B. Patterson, H.D.D., R.C.S., to facilitate operations on the teeth and jaws. There are two bearing-points for each jaw, and the instrument is thus kept securely in position, accidental rotation being impossible. Opening is maintained by a ratchet of the fine-toothed cam type, which gives a smooth action and permits of close gradation of adjustment. At two points on each arm and in the centre opposite the hinge a small peg is fixed and on to either of these the cheek-retractor may be hooked, five differing angles of retraction being provided in this way. The cheek-retractor

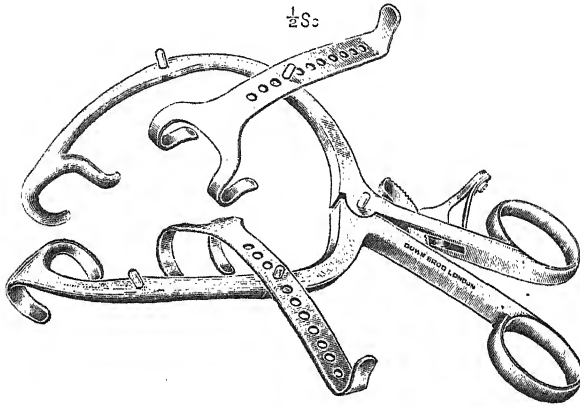


Fig. 104.

consists of a double hook borne on a stem in which is a series of perforations to fit the pegs on the arms of the gag. By this means retraction of varying extent may be applied. Two retractors are provided, a narrow one and a broad one. The instrument permits of an easy access to and a good view of the molar teeth of either jaw, the jaws themselves, the side of the tongue, and the inner aspect of the cheeks. It is anticipated that it will be found useful in many operations in the mouth and upon the maxillary antra, as well as in dental work for which it was primarily designed. (Down Bros. Ltd., London, S.E.1.)

Needle-holder (Norris's).—This improved pattern needle-holder has jaws which consist of three longitudinal segments in upper and lower blades, impinging on each other with variable pressure, thus allowing a firm grip and control of all styles, sizes, and shapes of suture needles at any angle (*Fig. 105*). The main feature of this holder is

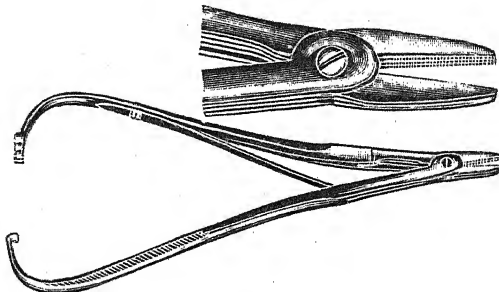


Fig. 105.

that there is no tendency to break the needle owing to the variable grip, and no possibility of needle movement during use. Price, 32s. 6d. each, stainless steel. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

Needle for Intravenous Infusion (Dr. Donald Bateman's).—The outer needle is tied into the vein; when the inner needle is removed, either for temporary discontinuance

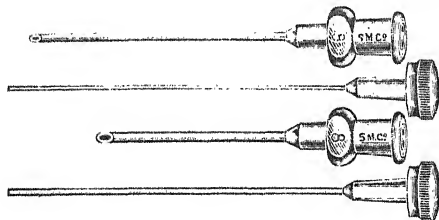


Fig. 106.

of saline administration or for cleaning, the large stilette is placed in the outer needle. The inner needle is cleaned with its own stilette (*Fig. 106*). (The Surgical Manufacturing Co. Ltd., 83-85, Mortimer Street, London, W.1.)

Myringotome (Royce's).—An adjustable instrument which when closed completely protects the points. This instrument can be used in two positions, either in the

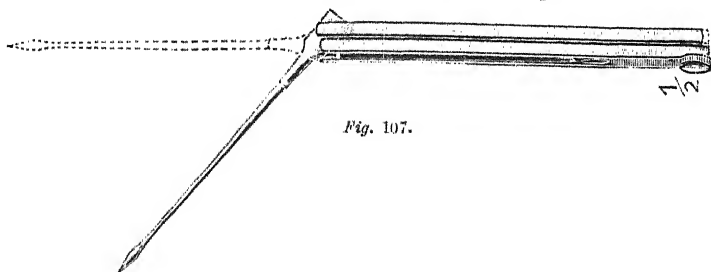


Fig. 107.

same plane as the handle or at an angle of 45° (*Fig. 107*). Price, 10s. 6d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

Obstetrical Table.—Dr. Daniel Douglass has introduced the obstetrical table illustrated in *Fig. 108*. It is placed on the bed, and the legs can be supported in the necessary

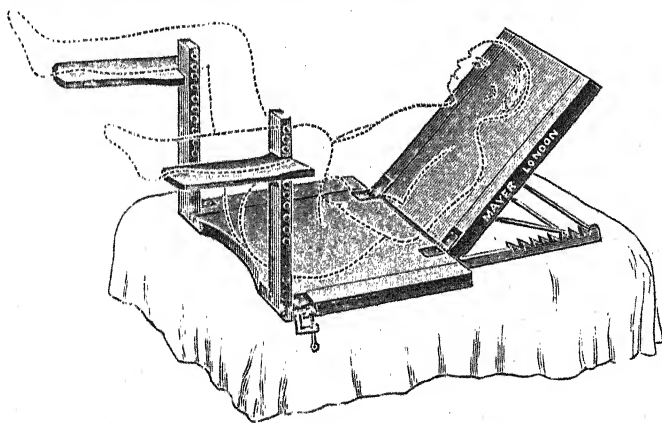


Fig. 108.

position. It folds up for portability and is carried in a canvas case. (Mayer & Phelps Ltd., 59-61, New Cavendish Street, London, W.1.)

Operating Lamp (The Keeler).—This is a small but compact piece of apparatus for use in eye operations, giving a homogeneous and intense patch of light for general operating work, with an adjustment for obtaining a very fine slit. Although the lamp is run from the mains current, its temperature remains as low as the average battery model. Price without the resistance, £8 8s. (C. Davis Keeler Ltd., 47, Wigmore Street, London, W.1.)

Ophthalmoscope.—The New Keeler Wide-angle Ophthalmoscope has been designed to enable the specialist or general practitioner to make a thorough examination of the fundus of an undilated pupil. Owing to its construction it is possible to obtain a wider and more brilliantly illuminated field than has previously been offered by any hand ophthalmoscope. Included in the equipment is an efficient red-free filter, transmitting only 17.3 per cent of red light, which, with the aid of the intense illumination supplied by the ophthalmoscope, enables the observer to make a red-free examination, a feat hitherto impossible with a hand instrument owing to the lack of intensity. By simply folding the small pin-hole disc into place it is also easy to view the macula without the presence of annoying corneal reflections. The instrument has the patent Keeler push-in battery handle base, which when left slightly withdrawn before returning the instrument to its case, breaks the flow of the current to the bulb and thus prevents accidental battery discharge. Prices: May model, £8 8s.; Morton model, £9 9s. (Designed and manufactured by C. Davis Keeler Ltd., 47, Wigmore Street, London, W.1.)

Ophthalmoscope (Emesay Reflexless).—This is a useful ophthalmoscope that can be used in an ordinary lighted room, and is suitable for bedside examination of a recumbent patient. The general practitioner, by routine examination with an ophthalmoscope, can frequently detect the earlier symptoms of an oncoming disease and take steps accordingly before the condition has become really serious. (Medical Supply Association, Ltd., 167-173, Gray's Inn Road, London, W.C.1.)

Ophthalmoscope Transformer.—The Gowlland Mains Ophthalmoscope Transformer (Fig. 109) is interchangeable with the usual battery handle with Ever-Ready battery No. 1829. It is supplied with a combined lamp holder and wall plug to convert 200-250 volts A.C. to 2.5 volts ophthalmoscope lamps. Battery-operated instruments can be converted to mains operation with a minimum of trouble. There are no cumbersome

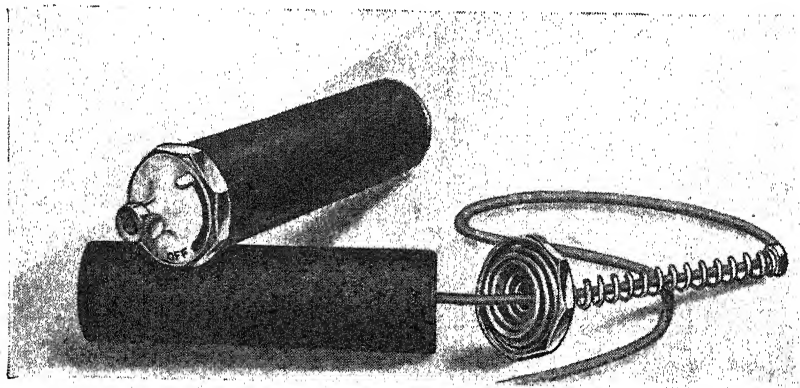


Fig. 109.

some external units, and only one cable 6 ft. in length connected to the transformer which fits into the battery handle. This is held firmly in position by a cap and special spring which also protects the cable at the point most likely to be injured. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Percussion Hammer, etc. A useful addition to the consultant's table has been designed by Dr. G. Burnett (*Fig. 110*). It combines a percussion hammer and a steel

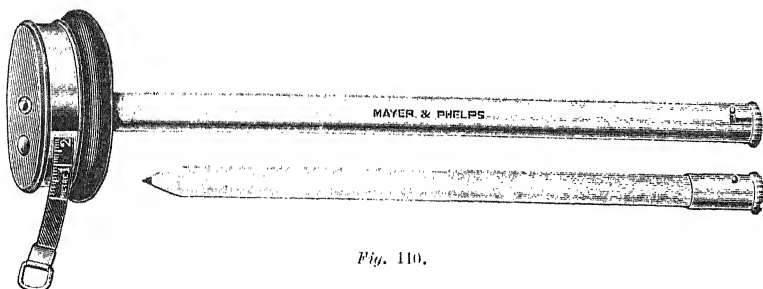


Fig. 110.

measuring tape, while concealed in the handle is a skin-marking pencil. (Mayer & Phelps, Ltd., 59, 61, New Cavendish Street, London, W.1.)

Percussor (Bennett's).—A modified Bennett's Percussor where either the small or

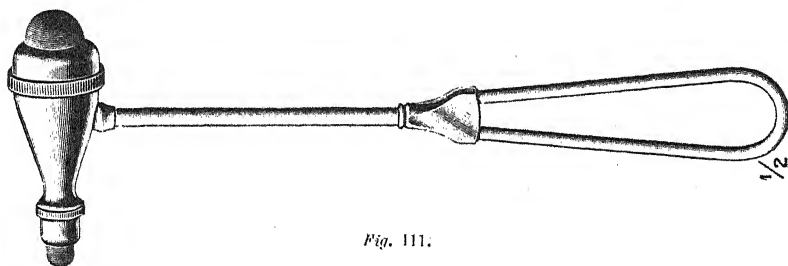


Fig. 111.

large head can be used. Both heads are removable for replacement of the rubber (*Fig. 111*). Price, 12s. 3d. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

Peritonsillar Abscess Opener.—The difficulties often experienced by the general practitioner in opening a peritonsillar abscess may be overcome by the instrument illustrated in *Fig. 112*, made at the suggestion of Mr. Arthur Miller. The advantages are: (1) It requires only a small opening of the mouth; (2) The instrument is intro-

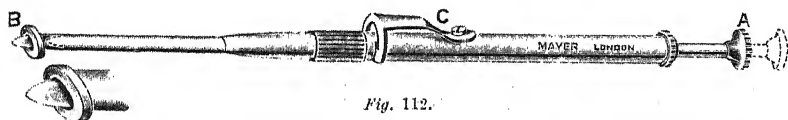


Fig. 112.

duced with the double-edged blade protected in its sheath, and is, therefore, safe; (3) The blade is kept under tension, and when released by pressing the spring catch C, produces a sharp and instantaneous, almost painless, cut. (Mayer & Phelps Ltd., 59-61, New Cavendish Street, London, W.1.)

Physiotherapy Apparatus.—This apparatus certainly needs consideration as it represents the latest design in physiotherapy equipment. For the therapist needing a safe and reliable apparatus operating from the main alternating current supply, it offers many attractions. Ripple-free galvanic current for ionic medication, cataphoresis, electrolysis, etc., is provided; also Bristow faradic for general nerve and muscle testing, and sinusoidal current for stimulation. An outstanding feature is the electromagnetic surger and interrupter fitted, which serves a dual purpose—namely, for surging a current or interrupting and reversing. With this apparatus the old-fashioned motor generator has been dispensed with and in its place the all-metal 'Westinghouse' rectifier is used. Special attention has been paid to the galvanic circuit, and to ensure ripple-free current specially calculated condensers and chokes have been introduced. The Bristow

section is also guaranteed to give the same electrical conditions as the standard Bristow coil working from dry cells. The whole is housed in a wood or metal cabinet, and is manufactured throughout by the Electro-Medical Supplies of 209B, Great Portland Street, London, W.1.

Plaster Splint Accessories.—Mr. Eric Lloyd, F.R.C.S., in an article in *The Lancet*, May 19, 1934, described new appliances and methods for dealing with plaster-of-Paris casts by the use of thin malleable copper strips placed next to the patient's limb (*Fig. 113*). A longitudinal cut is made with a knife in the plaster down on to this strip before the plaster is quite dry and the thin malleable strip is then withdrawn. This

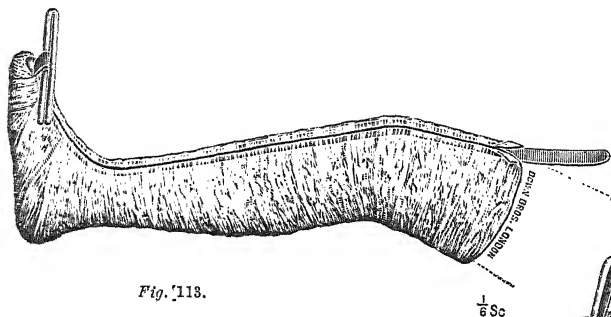


Fig. 113.

makes a plaster cast which is easily spread open and removed when required. For the purpose of spreading open the cast Mr. Lloyd has evolved a powerful and convenient plaster spreader (*Fig. 114*). The makers are Down Bros. Ltd., 21 and 23, St. Thomas's Street, London, S.E.1.

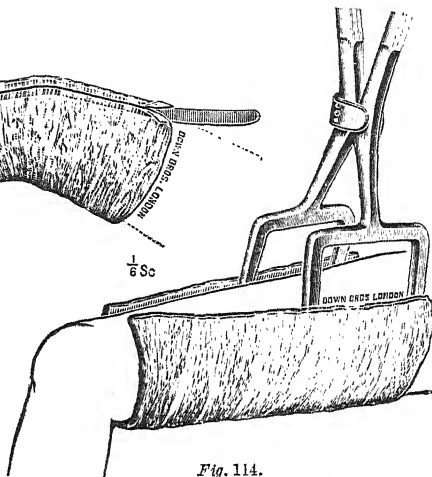


Fig. 114.

Plaster Splint Maker.—This instrument (*Fig. 115*) is intended to obviate the necessity of having two people when making plaster-of-Paris splints. The plaster bandage is threaded on to the removable pin and the frame adjusted to suit the width of the bandage, the whole instrument being then immersed in water until sufficiently saturated.

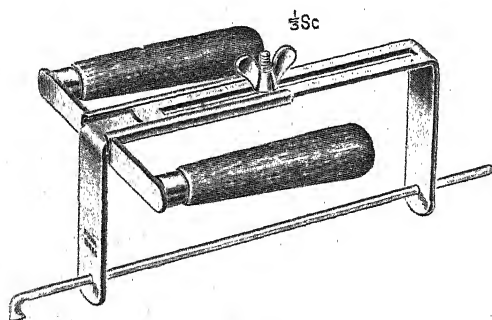


Fig. 115.

Holding the end of the bandage with the left hand on the table and the right handle of the instrument in the right hand, the spreader is moved towards the right slightly farther than the desired length of the splint, and then brought back on itself. The left hand now takes the left handle of the instrument while the right hand is placed on top of the loop of the bandage formed, and the spreader is moved to the left. Here again it comes slightly farther than the length of splint required, so that when it is brought back on itself a loop is formed on which, but never in which the left hand can be placed while the right hand once again takes the spreader.

The spreader should be moved as far as possible in contact with the splint and not held off it, and the fingers should never be placed inside the loops of bandage at the ends of the splints. The splints are usually from three to five layers thick—the frame of the spreader may be adjusted to take bandages varying from 3 to 6 in. wide. The instrument is made by Down Bros. Ltd., 21 and 23, St. Thomas's Street, London, S.E.1.

Pressoplast Lace Dressing.—This new British-made lace dressing or corset enables the wound to be dressed without undue disturbance to the patient, thus overcoming the disadvantages of the many-tailed bandage. It also gives even support to the wound, and does not constrict the chest or abdomen. Pressoplast is invaluable for applying pressure to closed wounds, for closing incisions without sutures, and for the approximation of callous wounds. It is also used after amputations to exert traction

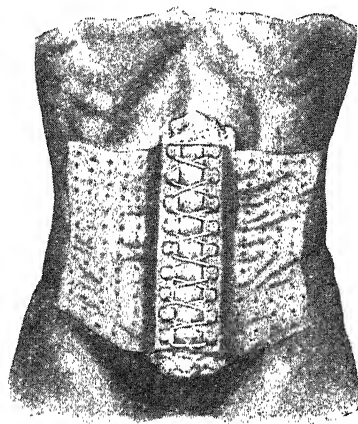


Fig. 116.

on the skin, and after goitre and jaw operations. Pressoplast consists of a sheet of non-irritant zinc-oxide plaster perforated to allow skin ventilation; along one longitudinal edge is fixed a malleable piece of copper with corset hooks. (Fig. 116.) It adheres firmly to the skin without creeping, and when the lace is applied, firm traction is obtained. Once applied it is allowed to remain *in situ*, the corset being undone and the dressing changed as required. Sheets may be easily cut to the size required according to the length of the incision. There are two standard sizes, measuring 12×5 and 12×10 in. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Pyrometer for Steam Sterilizers.—One of the problems of the operating theatre is to ascertain the temperature reached in the centre of a packet, tin, or drum of dressings in a sterilizer. This temperature is very different from that of the superheated steam round the outer side of the packet or tin, though the latter alone is registered, either by a thermometer projecting into the sterilizer and capable of being read from the outside, or, more commonly, by means of a pressure gauge. There is no difficulty in

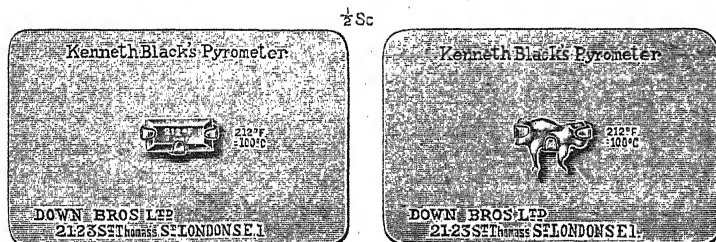


Fig. 117.

ascertaining the temperature in the centre if a special high-registering thermometer is used, but such a thermometer is unsuitable for ordinary use, being costly, easily broken, and inconvenient. The pyrometer, however, cheap and perfectly reliable, consists of four oblongs of fusible metal, with varying melting points, which are buried in the centre of the dressings before sterilization. A cheaper type (Fig. 117) consists of a single oblong melting at 212°F . Each oblong of metal costs 3d. only. (Down Bros. Ltd., 21 and 23, St. Thomas's Street, London, S.E.1.)

Rack and Tray for Instruments (Ogilvie's).—This was commented upon in *The Lancet* on December 8, 1934, and the Medical Supply Association Ltd. (167-173, Gray's Inn Road, London, W.C.1) now advise that they are in a position to supply this ingeniously designed unit.

Radium Applicator.—A radium applicator for gynaecological work, made to a model supplied by Mr. G. F. Stebbing, M.B., B.S., is shown in *Fig. 118*. It consists of two cork containers for the radium capsules joined together by a watch spring covered with

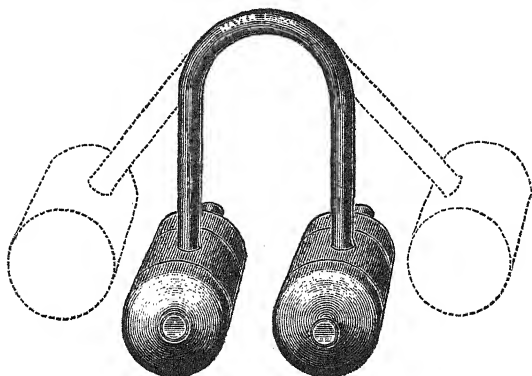


Fig. 118.

rubber, which keeps the apparatus in position in the vagina and fornices. Mr. Stebbing has also devised an applicator for the rectum. (Mayer & Phelps, Ltd., 59-61, New Cavendish Street, London, W.1.)

Retarding Device (Dash-pot) for Sterilizers.—This contrivance for controlled automatic lowering of the lid and tray of the sterilizer, prevents splashing of boiling water when the tray is lowered, and allows the lifting device to be actuated by the elbow instead of by the hand. It does not effect the lifting of the tray as the retarding device only comes into operation on the downward movement. (The Standard Surgical Mfg. Co. Ltd., Westfield Road, North Acton, London, W.3.)

Retractor.—*Fig. 119* shows a retractor devised by Mr. Norman Lock, F.R.C.S., for use in gall-bladder operations. The method of its use is as follows: The abdomen is opened by the right rectus sheath incision about 1 in. from the mid-line, Moynihan's rubber and tetra cloth pads about 8 x 12 in. are laid over the wound edges and tucked in, and a self-retaining retractor is inserted. Another rubber pad is then laid on the stomach and Dyball's retractor inserted, which lifts the stomach out of the way to the

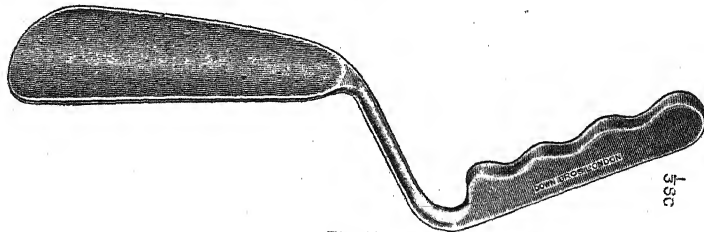


Fig. 119.

left. Another pad is laid over the intestines and the Lock retractor is inserted with the handle towards the pubes. The portal fissure, gall-bladder, and common duct are then easily displayed. The handle gives a firm grip to the assistant and is well out of the way of the operator, while at the same time the retractor reflects the light up into the portal fissure. With the blade laid the other way up, the retractor may be used as a depressor to keep the intestines in place while the peritoneum is being sewn up. (Down Bros. Ltd., 21 and 23, St. Thomas's Street, London, S.E.1.)

Saw-head.—This consists of a head for attaching to an ordinary electrically driven saw, and provides two circular saws mounted upon individual spindles revolving in opposite directions. The distance between the two saw edges can be very finely adjusted. This type of saw head is of particular value, as it enables a perfectly clean section of a bone to be cut, and, moreover, the blades revolving in opposite directions cancel out their own individual torque action, giving the operator a much more steady control. (The Medical Supply Association Ltd., 167-173, Gray's Inn Road, London, W.C.1.)

Scalpel Case, Spirit-proof.—A compact spirit-proof case made entirely of metal without any rubber washers (*Fig. 120*). It has a cone-fitting lid that ensures perfect

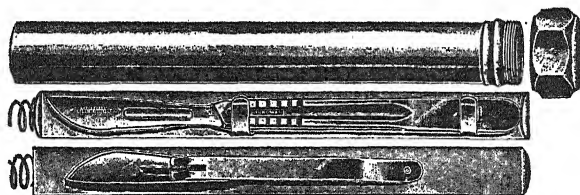


Fig. 120.

joints and prevents any possibility of leaking. It can be supplied with an interchangeable-bladed scalpel, for which it is intended. (The Surgical Manufacturing Co. Ltd., 83-85, Mortimer Street, London, W.1.)

Scissors with Renewable Edges.—The Bard-Parker scissors (*Fig. 121*) facilitate operating technique because the edges are uniformly sharp. These scissors require

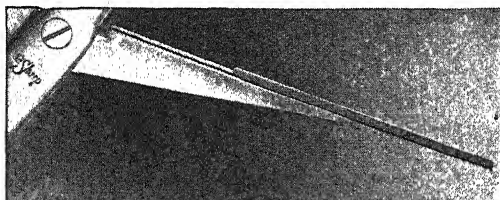


Fig. 121.

no regrinding as dulled edges are quickly replaced with new keen edges, thereby effecting economy. A variety of shapes and sizes is available. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Septum Knife.—The knife illustrated in *Fig. 122* has been designed by Mr. Arthur Miller, F.R.C.S., for the submucous reception of the septum. It is double-edged at the sides and somewhat oval-shaped at its extremity. The incision in the mucosa begins in the uppermost angle of the nostril and is continued in one sweep right down to the floor of the nose. The cutting edge starts the incision, about half-way down



Fig. 122.

the septum, the extremity of the knife takes it up, then the upper cutting edge is engaged, and finally the extremity is again used to complete the incision on the floor of the nose. The advantages claimed are: facility of producing the incision with one single sweep and the impossibility of penetrating the septum, while it takes the place of a sharp dissector to detach the muco-perichondrium. (Mayer & Phelps, Ltd., 59-61, New Cavendish Street, London, W.1.)

Shadowless Lamps.—Messrs. Kelvin Bottomley & Baird, Ltd. (18, Cambridge Street, Glasgow, C.2) have added new types and improvements to their well-known range of shadowless lamps for operating-theatres, examination rooms, etc. The optical arrangements are such that fatigue to the eyes of the surgeon is practically eliminated as strong contrasts are avoided. The shadowless illumination is produced by scientifically designed metallic reflecting surfaces which do not involve any breakable glass mirror units, lenses, etc. The lamps are therefore very robust. All types have been designed in collaboration with surgeons and in contact with the best operating-theatre practice.

Short-wave Therapy.—The Novotherm range of short-wave therapy equipment consists of three valve-operated machines having an output of 450, 700, and 1000 watts respectively. Short-wave therapy is being increasingly used in place of classical diathermy. The Novotherm equipment operates at a wave-length of 25 metres, which the makers contend to be the most satisfactory region from both the therapeutic and electrical aspects. (Watson & Sons (Electro-Medical) Ltd., 43-47, Parker Street, Kingsway, London, W.C.2.)

Shropshire Orthopaedic Horse.—This operation table has a number of useful adjustments, and enables the orthopaedic surgeon to perform his operation in an absolutely clear field. It would seem that every possible desired movement of the patient can be secured when he is mounted on this orthopaedic table, and the understructure is so devised that a clear field for X-radiography is provided, thus enabling the surgeon to check the position of bone fragments during any stage of immobilization, even through plaster-of-Paris. (The Medical Supply Association Ltd., 167-173, Gray's Inn Road, London, W.C.1.)

Skin-graft-cutting Apparatus.—Mr. Graham Humby, of Guy's Hospital, has evolved the machine shown in Fig. 123. (See *Brit. Med. Jour.*, 1934, June 16.) It consists of a rigid rectangular framework, which is strapped on the limb. Tiny needles on a

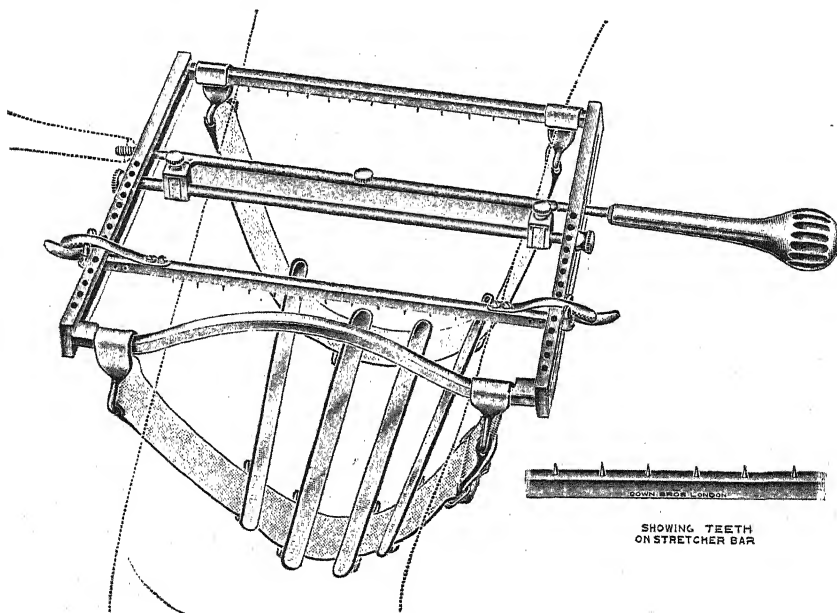


Fig. 123.

crossbar at either end pierce the skin to a depth of $\frac{1}{8}$ in. and allow of stretching of the skin surface, the degree of tension being adjustable by a simple ratchet mechanism. Sliding in the framework is a knife 7 in. long and wafer-thin, which is removable and

renewable in the same way as is a safety-razor blade. In front of this knife is a roller, which is so arranged that it precedes the cutting edge by $\frac{1}{2}$ in., and thus constantly presents to the knife as it advances a flat skin surface from which to cut. The angle at which the cutting edge meets the skin is adjustable, and allowance is made for a to-and-fro movement through a range of 1 in. in a direction at right angles to the side members of the frame. This allows the knife to be used after the manner of a saw, advancing little by little with each thrust. Grafts of different thicknesses can be cut with the same instrument by varying the depth of the cutting edge, and simple adjustment regulates their breadth up to the maximum available on the limb. The machine should prove of particular value to the general surgeon who is called upon to perform a skin-grafting operation on only rare occasions, enabling him to cut large grafts with comparative ease. (Down Bros. Ltd., 21 and 23, St. Thomas's Street, London, S.E.1.)

SPECULA.

Speculum for Nasal Packing.—A speculum for nasal packing (*Fig. 124*) has been designed by Mr. Seymour Jones, F.R.C.S. The attachment to the Hajek speculum is for the purpose of carrying small spools of absorbent gauze for cocaine packing of the nose for polypi, hyperplasias, etc. They are great time-savers in an out-patient department. Sixteen spools can be prepared by the sister, and mounted on metal pins on a tray in a metal box. All that is necessary is to drop the spool into the anæsthetic

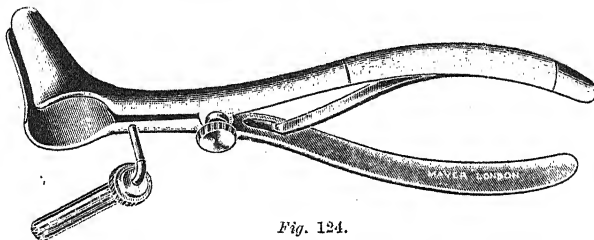


Fig. 124.

solution and give it a slight squeeze to drain off excess fluid. Ribbon gauze is very easily wound on the metal spool. Four of the sixteen spools in the box may conveniently be mounted with B.I.P. gauze for packing the nose after resection of turbinates. (Mayer & Phelps Ltd., 59-61, New Cavendish Street, London, W.1.)

Rectal Speculum.—A rectal speculum, U.S.A. pattern, made on the principle of a Gossett's retractor (*Fig. 125*). The handles are hinged so that they are out of the way

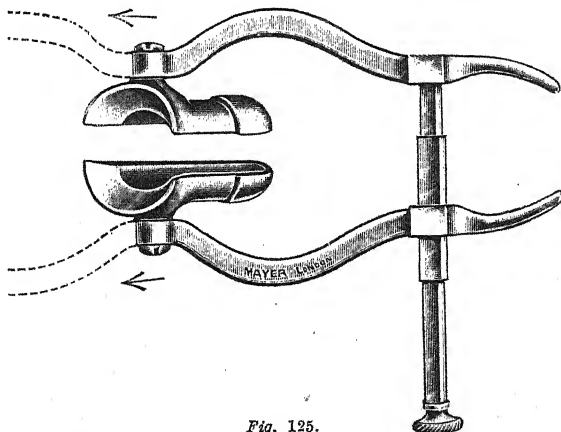


Fig. 125.

of the operator, and the instrument is self-retaining owing to the shape of the blades, and gives an excellent view and approach to the parts. (Mayer & Phelps, Ltd., 59-61, New Cavendish Street, London, W.1.)

Vaginal Speculum.—Mr. Hamish Nicol, F.R.C.S., has suggested an adaption of Killian's nasal speculum with long blades for use in examining the vagina of infants

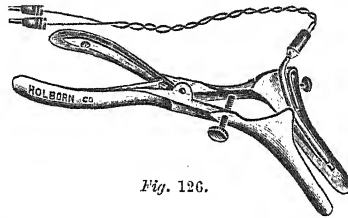


Fig. 126.

and young girls (Fig. 126). It is fitted with a fixing screw to keep the blades apart when *in situ*, and a small electric lamp attachment gives excellent illumination. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, Holborn Circus, London, E.C.)

Vaginal Speculum (O'Sullivan's).—This speculum is for examination and operation. It is supplied with four different sized blades— $2\frac{1}{2} \times \frac{7}{8}$ in., $3\frac{1}{2} \times 1\frac{3}{8}$ in., $3\frac{1}{2} \times 1\frac{1}{4}$ in.,

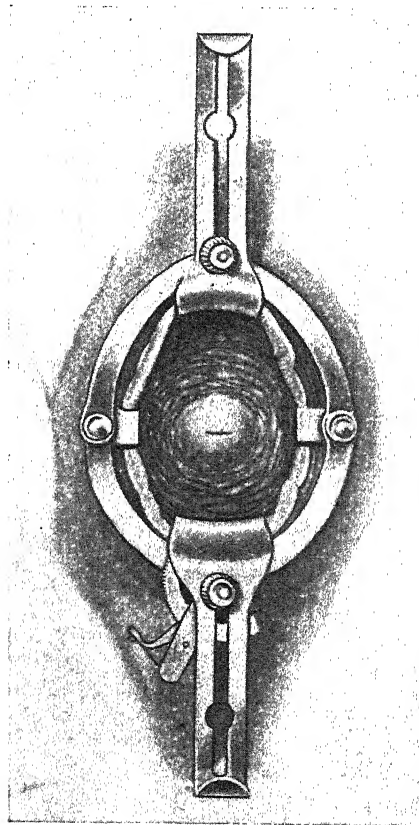


Fig. 127.

$2\frac{3}{4} \times 2\frac{1}{8}$ in. The body is made in four pieces and controlled by a spring ratchet. There are two small lateral blades which work on pivot joints for primary introduction and

two small handles. The blades selected for use are placed in position and fixed by a knurled nut (*Fig. 127*). Price, £4 17s. 6d., chrome-plated. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

Sphygmomanometer.—The new Accoson pocket sphygmomanometer is the smallest model made (*Fig. 128*). It is individually calibrated to 250 mm. from the standard mercury container. All bright parts are made of stainless steel. It is guaranteed

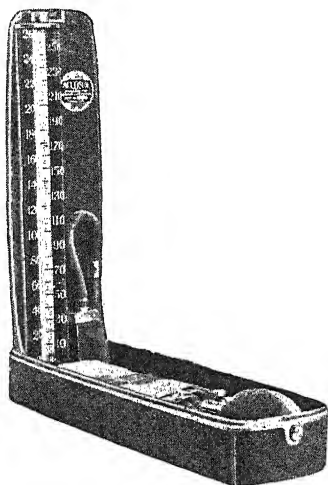


Fig. 128.

accurate and is supplied in attractive cast Alpac metal case. Weight 36 oz. Size $11\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2}$ in. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Sphygmomanometer Armlet.—The Accoson armlet (*Fig. 129*) is designed to provide a cuff that has all the advantages of a rigid exterior but is compact in packing as a soft silk armlet. This is achieved by inserting between the silk a series of duralumin metal strips at short intervals, fitted with studs and key-hole slots. The armlet is instantly

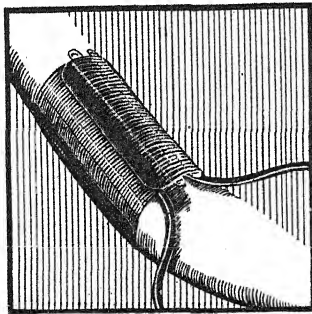


Fig. 129.

fixed by placing it once round the arm and fastening the slips. There is no unevenness caused by tucking in the ends, and therefore a firm even covered surface is maintained. Supplied with length of rubber tube and metal push-on connection. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Sphygmomanometer Bulb.—The improved Aceoson bulb (*Fig. 130*) with control valve is easy to handle, trouble-free, and all parts are interchangeable. It contains



Fig. 130.

an adjustable tension spring and, is fitted with a metal collar protecting neck of the bulb. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Spinal Support.—This is a spinal with adjustable compression springs, giving an assured lift to the body with the weight taken on the crests and axilla, also under the floating ribs. It is effective for tuberculosis of the spine and has also been tried out for fractures. It should prove advantageous in deformity cases, as it is felt that with

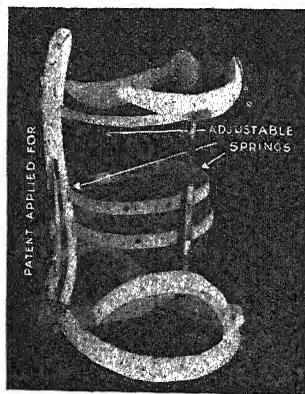


Fig. 131.

the extension more lift can be given on one side than the other; also the compression springs will continually lift the weight of the patient while pressure plates can be more effectively used. Made of light duralumin. A perfectly straight rigid lift is maintained. (*Fig. 131.*) (W. J. Wilson & Co. Ltd., 45, Bedford Row, Holborn, London, W.C.1.)

Sterilizer Cut-out.—An improved cut-out of the hand-resetting pattern for electric sterilizers is now available. Fully enclosed switch in heat-resisting bakelite, suitable for loads up to 3000 watts. Operates on the principle of an expanding tube and non-expanding rod. Allows a very fine setting and is compactly built in one unit with no loose parts. (The Standard Surgical Mfg. Co. Ltd., Westfield Road, North Acton, London, W.3.)

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lid and tray in one movement. The sterilizers are tested and guaranteed and are of British manufacture throughout. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Stethoscope for Teaching.—Dr. William Evans has designed a teaching stethoscope (*Fig. 132*). It consists of a scientifically constructed sound chamber which incorporates a diaphragm and tension wire designed to transmit heart-sounds which are mostly within the bass range of piano notes. Although the intensity of the sounds is diminished to some extent, the quality is preserved. Six observers (the instructor and five students) may auscultate the chest at the same time, and in this way the teacher is able to emphasize certain characteristics as they occur. It thus aids the

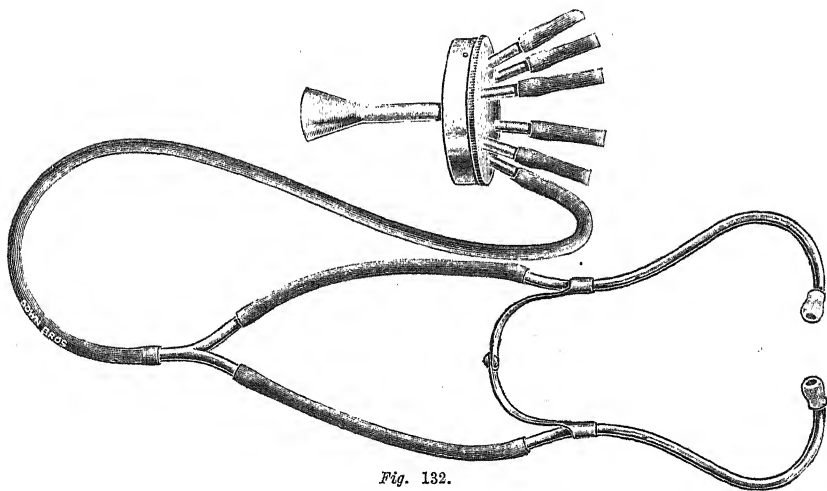


Fig. 132.

instruction of students in the first principles of auscultation and provides the means of knowing that the student has heard the particular abnormality to which his attention has been drawn. The stethoscope also enables every student among a moderately large class to elicit a particular auscultatory sign in a patient without causing the discomfort involved by repeated individual examination. (Down Bros. Ltd., 21 and 23, St. Thomas's Street, London, S.E.1.)

Suture Clips.—Weka wound clips (*Fig. 133*) are made with a soft metal hinge and two wing grips. They are applied in the same way as Michel's clips (*a* and *b*), but can be removed with the same forceps by means of the wings, which when pressed together cause the clip to straighten out (*c* and *d*). The removal entails no pain to the patient.

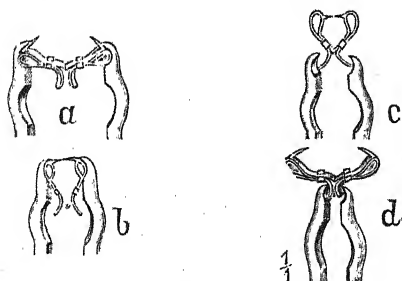


Fig. 133.

They are economical in use, as each clip can be used several times. Price: Complete set of forceps and 100 clips, in nickel-plated case, 21s. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, Holborn Circus, London, E.C.)

Suture Buttons (Emesay).—These seem to offer a satisfactory solution to yet another of a surgeon's troubles. They save the cutting effect of the suture on the tissues surrounding the operational wound, as they take off all stress. The suture is positioned in the usual way and finally brought up through the button, which has a special nipple that can then be squeezed tight. This then grips the suture and in turn takes the pressure of the strain from the stitching on to a flat surface about $\frac{3}{4}$ in. diameter, instead of the full pull being exerted by the thin suture on the patient's tissue. It is particularly valuable for closing abdominal wounds. (The Medical Supply Association Ltd., 167-173, Gray's Inn Road, London, W.C.1.)

Syringe, Lipiodol.—A syringe for the intra-oral administration of lipiodol in pulmonary diagnosis, essentially for the man who works alone, has been devised by Mr. James Raffan, F.R.C.S. (*Fig. 134*). A laryngeal mirror is attached to a movable band round the barrel of a Record type syringe. If a head-light is used the left hand is free for holding the tongue. The lipiodol should be warmed to blood heat, and the back of the mouth

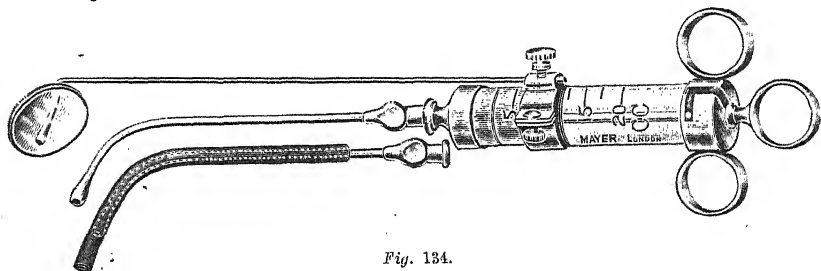


Fig. 134.

and palate sprayed with 4 per cent cocaine by means of the extra nozzle provided. The patient should be sitting upright if the lower zones are to be investigated, or recumbent if the middle or upper zones are to be dealt with. The lipiodol can be seen going into the larynx, and the side and the particular lobe to be examined can be controlled. (Mayer & Phelps Ltd., 59-61, New Cavendish Street, London, W.1.)

Thermometer Case.—Dr. B. Richardson Billings (Folkestone) has designed a case (*Fig. 135*) which consists of a strong metal tube longitudinally fenestrated, and lined with a pyrex glass tube (the strongest glass known), the end of this lining being ground to a water-tight fit against washers at each end. The lower end of this tube has a light compression spring-loaded ferrule, in which the bulb of the thermometer is held. The screw cap at the other end presses the thermometer down into the tube and keeps it comfortably housed—in spirit or other antiseptic. A clip, of the fountain-pen type,



Fig. 135.

keeps the case safely in one's pocket. Risk of damage through undue pressure being applied (as, for instance, when leaned upon while in the waistcoat pocket) is minimized. In the rare contingency of the glass liner becoming broken, this can easily be replaced at a cost far below that of a new thermometer. Owing to atmospheric pressure, when the thermometer has been extracted and the case laid on its side, the fluid does not run out. Price, 7s. 9d., including thermometer; spare barrels, 6d. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, Holborn Circus, London, E.C.1.)

Thermometer Jars.—These jars (*Fig. 136*) have a heavy glass base, and a well for antiseptic fluid. They are equally useful for consulting room or hospital ward. Price 24s. per dozen. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, Holborn Circus, London, E.C.)

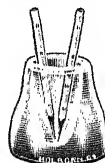


Fig. 136.

Tongue Depressor (Morris's).—This instrument (*Fig. 137*) has been devised to hold the tongue securely during operation for impacted teeth. It is also suitable for use

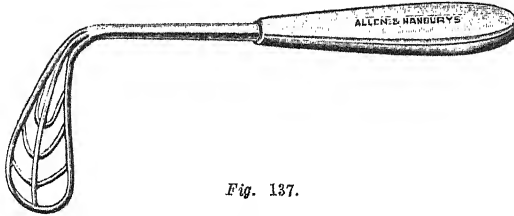


Fig. 137.

during any surgical operation in the mouth. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Tracheotomy Tube Valve.—This valve (*Fig. 138*), devised by Mr. E. Musgrave Woodman, F.R.C.S., is intended to control the air-pressure in the lungs after tracheotomy. It must be used immediately after the operation when the distress due to the change is at its greatest, to prevent cedema and collapse of the lung. The size of the airway

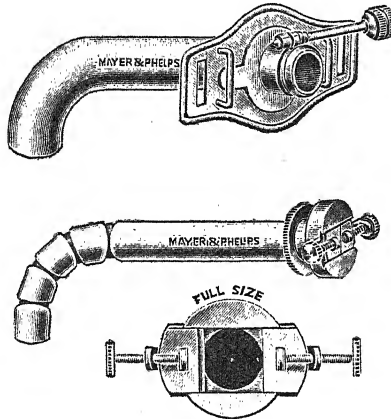


Fig. 138.

can be readily adjusted by the nurse, but is never so large as the tracheotomy tube opening; the patient still has to work for breath, but less than before, and the nurse is instructed to give the screw a turn every hour, so as to widen it gradually to the necessary extent. (Mayer & Phelps Ltd., 59-61, New Cavendish Street, London, W.1.)

Truss.—During 1934 the Smith Surgical Service (59, Gray's Inn Road, London, W.C.1.) manufactured a new featherweight spring truss (*Fig. 139*) suitable for slight



Fig. 139.

hernia, and weighing only 4 oz. It is remarkably light, yet perfectly reliable for its purpose. The hernia is held firmly without the slightest fear of slipping.

Truss.—The Heeson improved type super elastic truss is designed with the tail section attached to the upper margin of the pad. By this method the pull of the tail is taken over the whole area of the pad instead of merely at the lower margin as in other makes of elastic trusses, thereby exercising greater control on the external ring. It is made in the finest quality silk elastic with soft kid-covered pneumatic heads. Price: single, 31s. 6d.; double, 42s. (H. E. Curtis & Son Ltd., 7, Maudeville Place, Wigmore Street, London, W.1.)

Urethral Dilating Bougie and Catheter Combined.—These bougies have the shape of the well-known Lister's bougies, and in addition each one has a narrow tubular channel running through its long axis. (*Fig. 140.*) They are made in three sizes, 4/7, 6/9, 8/11 English gauge. They were designed by Mr. Milroy Paul, F.R.C.S., of Colombo, to obviate the necessity for passing a metal catheter in dealing with acute retention of

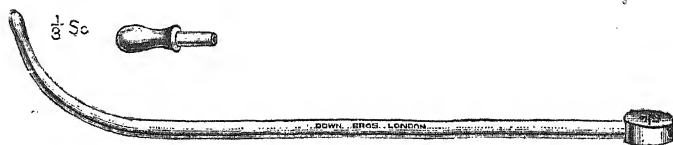


Fig. 140.

urine from a urethral stricture. The bougies have proved very satisfactory in practice, as they are passed more easily than a metal catheter owing to their greater weight, better balance, and their bulbous ends; they are also of service in cases of enlarged prostate when it is necessary to use a metal catheter to relieve acute retention. (Down Bros. Ltd., 21 and 23, St. Thomas's Street, London, S.E.1.)

Urinacidometer ('Allenburys').—This is for estimating the urinary acidity (PH) in connection with the use of ketogenic diets for epilepsy, chronic urinary infections, etc. It contains five indicator solutions, a pipette for transferring samples to test-tubes, eight special flat test-tubes, spare corks, and five coloured charts corresponding to the indicators. One of the indicators covers the whole range of the four others, which are of short range. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

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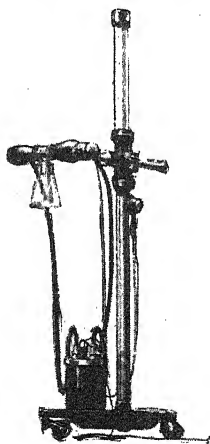


Fig. 141.

form of mounting makes it very convenient, more especially for the radiography of joints, etc., and it has the advantage of occupying very little space. (*Fig. 141.*) (Watson & Sons (Electro-Medical) Ltd., 43-47, Parker Street, Kingsway, London, W.C.2.)

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Bristol House, near Bristol. Res. Physician, Dr. F. E. Fox. Bristol, 3 miles.

Somerset & Bath Mental Hospital, Cotford, near Taunton. Res. Med. Supt., Dr. W. S. Graham. Norton Fitzwarren station, 2 miles.

The Mental Hospital, Wells, Som. Res. Med. Supt., Dr. J. McGarvey. Wells station, S. & D.J.R., and G.W.R., 1½ miles.

STAFFORDSHIRE.

Ashwood House, Kingswinford, Dudley. Props., Drs. Peacock and Pietersen. Res. Med. Supt., Dr. J. F. G. Pietersen. Stourbridge June, 3½ miles; Dudley station, 4 miles; Wolverhampton, 7 miles. Tel.: 19 Kingswinford.

See also *Advt.*, p. 115

Coton Hill Mental Hospital, Stafford. Res. Med. Supt., R. MacDonald, M.D., D.P.M. Stafford, 1 mile.

See also *Advt.*, p. 115

County Mental Hospital, Burntwood, near Lichfield. Res. Med. Supt., W. Reid, M.A., M.B. Lichfield City, 3½ miles; Hammerwich, 1½ miles.

County Mental Hospital, Cheddleton, Leek. Med. Supt., W. F. Menzies, M.D. Wall Grange station, 1 mile.

County Mental Hospital, Stafford. Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

The Moat House, Tamworth (for ladies). Res. Medical Attendant, Dr. W. Lowson. Tamworth station, ¾ mile.

SUFFOLK.

St. Audry's Hospital for Mental Diseases, Melton. Res. Med. Supt., W. Brooks Keith, M.C., M.D. Melton station, 1½ miles; Woodbridge station, 2½ miles.

The Mental Hospital, Ipswich. Res. Med. Supt., P. Banbury, D.P.M. Ipswich, 2 miles.

SURREY.

County Mental Hospital, Brookwood, Woking. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1½ miles.

County Mental Hospital, Netherne, near Coulsdon. Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

Croydon Mental Hospital, Warlingham. Res. Med. Supt., H. M. Berncastle, M.R.C.S., L.R.C.P. Upper Warlingham, $3\frac{1}{2}$ miles.

Holloway Sanatorium, Registered Mental Hospital, St. Ann's Heath, Virginia Water. Res. Med. Supt., Henry Davine, O.B.E., M.D., B.S., F.R.C.P. Asst. Med. Offs., Thomas E. Harpor, M.R.C.S. (Eng.), L.R.C.P. (Lond.), Cecil Rutherford, B.A., M.B., B.Ch., B.A.O., John G. Hamilton, M.B., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.P.M., Harriette Grenelle Bogle, M.B., Ch.B., M.D. (Edin.) Virginia Water station, 5 minutes. Seaside Branch, *St. Ann's, Canford Cliffs, Bournemouth.* Med. Off., C. G. Cowie, M.D. See also Advt., p. 111

SUSSEX.

Ashbrook Hall, Hollington, St. Leonards-on-Sea (for ladies). Res. Lic., Charles E. H. Somerset. Warrior Square station, 2 miles.

Beechmont, Lewes Road, Haywards Heath. For female private patients. Apply Med. Supt.

Brighton County Borough Mental Hospital, Haywards Heath. Res. Med. Supt., G. H. Harper-Smith, M.A., M.D. Haywards Heath station, $1\frac{1}{2}$ miles.

East Sussex County Mental Hospital, Hellingly, near Eastbourne. Res. Med. Supt., Benjamin Reid, M.D., M.R.C.P., D.P.M. Hellingly station, 1 mile.

Periveau House, Winchelsea, near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

St. George's Retreat, Burgess Hill. Licensee, Miss Mary Doran. Med. Supt., Dr. R. D. Pennefather. Burgess Hill station, 2 miles.

Ticehurst House, Ticehurst. Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Rd., 3 miles.

West Sussex Mental Hospital, Greylingwell, Chichester. Res. Med. Supt., C. G. Ainsworth, M.A., LL.B., M.B., B.Ch. Chichester station, $1\frac{1}{2}$ miles.

WARWICKSHIRE.

Birmingham City Mental Hospital, Winson Green. Res. Med. Supt., Dr. C. W. Forsyth. Birmingham, $1\frac{1}{2}$ miles; Soho, $\frac{1}{2}$ mile.

County Mental Hospital, Hatton, near Warwick. Res. Med. Supt., A. T. W. Forrester, M.D. Also *Leigh House*, for lady private patients. Warwick, G.W.R. station, 3 miles. See also Advt. p. 119

Glendossill, Henley-in-Arden, Warwickshire. Res. Med. Supt., Dr. W. Agar. Henley-in-Arden, G.W.R., $\frac{1}{2}$ mile.

Rubery Hill and Hollymoor Mental Hospital, Birmingham. Res. Med. Supt., T. C. Graves, M.D., F.R.C.S. Rubery station, $\frac{1}{2}$ mile; Northfield, L.M. & S.R., 1 mile.

WILTS.

Fiddlington House, Market Lavington. Med. Supt., J. R. Benson, F.R.C.S. Res. Licensee, The Rev. E. Benson. Lavington G.W.R., 1 mile; Devizes, 6 miles.

See also Advt., p. lii

Kingsdown House, Box. 5 miles from Bath. Res. Med. Supt., Dr. H. C. MacBryan. See also Advt., p. 85

Laverstock House, Salisbury. Med. Supt., J. R. Benson, F.R.C.S., L.R.C.P. Salisbury, $1\frac{1}{2}$ miles. See also Advt., p. 106

Old Manor Mental Hospital, Salisbury. Med. Supt., Dr. S. E. Martin. Salisbury station, S.R., 5 minutes.

See also Advt., p. 110

Wilts County Mental Hospital, Devizes. Res. Med. Supt., J. W. Leech, M.D. Devizes station, $1\frac{1}{2}$ miles.

WORCESTERSHIRE.

County & City Mental Hospital, Powick, Worcester. Res. Med. Supt., Dr. H. F. Fenton. Worcester station, 4 miles.

Worcestershire Mental Hospital, "Barnsley Hall," Bromsgrove. Res. Med. Supt., Dr. A. H. Firth. Bromsgrove, L.M. & S.R., $2\frac{1}{2}$ miles.

YORKSHIRE.

Bootham Park Registered Hospital, York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile. See also Advt., p. 118

City Mental Hospital, Hull. Res. Med. Supt., Dr. J. S. Anderson. Willerby station, 1 mile; Hull, 6 miles.

East Riding of Yorkshire County Mental Hospital, Beverley. Res. Med. Supt., T. M. Davie, M.C., M.D. Beverley station, 2 miles.

Moorlyn, Mount Villas, York. Res. Phys. Supt., Dr. Janie S. Baugh. York station, 1 mile.

North Riding of Yorkshire Mental Hospital, Clifton, York. Res. Med. Supt., Dr. J. I. Russell. York, 2 miles.

St. Luke's Hospital, Middlesbrough. Res. Med. Supt., Dr. H. G. Drake-Brockman. Middlesbrough, 2 miles.

South Yorkshire Mental Hospital, Wadsley, near Sheffield. Res. Med. Supt., Arthur Pool, M.R.C.P. Wadsley Bridge, 1 mile (goods); Sheffield, 4 miles (passengers).

The Friends' Retreat, York. Res. Med. Supt., Dr. Neil Macleod. York station, $1\frac{1}{2}$ miles. See also Advt., p. 80

The Grange, Rotherham. 5 miles from Sheffield (for Ladies). Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, L. & N.E.R., $\frac{1}{2}$ mile.

See also Advt., p. 113

West Riding Mental Hospital, Menston, near Leeds. Res. Med. Supt., S. Edgerley, M.D. Guiseley, L.M. & S.R. 1 mile.

West Riding Mental Hospital, Burley-in-Wharfedale, Scalebar Park. Res. Med. Supt., Dr. J. R. Gilmour. Burley-in-Wharfedale station, L.M. & S.R., $\frac{1}{4}$ mile.

West Riding Mental Hospital, Storthes Hall, Kirkburton, near Huddersfield. Res. Med. Supt., C. W. Ewing, L.R.C.P. and S.I., D.P.M. Huddersfield, 5 miles. Kirkburton (Goods only) $1\frac{1}{2}$ miles.

West Riding Mental Hospital, Wakefield. Res. Med. Supt., C. J. Thomas, M.R.C.S., L.R.C.P., D.P.M., D.P.H. Kirkgate and Westgate stations, 1 mile.

York City Mental Hospital, Fulford, York. Res. Med. Supt., Dr. R. A. Hooper. Naburn, L. & N.E.R., 1 mile.

CHANNEL ISLANDS.

St. Peter Port Asylum, Guernsey. Med. Off., W. R. McGlashan, M.A., M.B., Ch.B., D.P.M.

Jersey Mental Hospital, Jersey. Res. Med. Supt., C. Noble le Brocq, M.D. St. Helier, $\frac{3}{4}$ miles.

ISLE OF MAN.

Mental Hospital, Union Mills, Douglas. Res. Med. Supt., Leslie H. Skene, M.C., M.B., Ch.B., Dipl. Psych. (Ed.) Union Mills, $\frac{1}{2}$ mile.

BRECKNOCKSHIRE.

Mid-Wales Counties Mental Hospital, Talgarth. Res. Med. Supt., Dr. P. Drummond. Talgarth, 1 mile.

CARMARTHENSHIRE.

Joint Counties Mental Hospital, Carmarthen. Res. Med. Supt., Sidney Davies, M.B., B.S., D.P.M. Carmarthen, G.W.R. station, $1\frac{1}{2}$ miles.

DENBIGHSHIRE.

North Wales Counties Mental Hospital, Denbigh. Res. Med. Supt., Frank G. Jones, M.B. Denbigh, 1 mile.

GLAMORGANSHIRE.

Cardiff City Mental Hospital, Whitchurch, Cardiff. Res. Med. Supt., P. K. McCowan, M.D., F.R.C.P., D.P.M., Barrister-at-Law. Llandaff, G.W.R. station, 1 mile.

Glamorgan County Mental Hospital, Bridgend. Res. Med. Supt., D. Rhod Owen, M.B. Bridgend, $1\frac{1}{2}$ miles.

Swansea Mental Hospital, Cefn Coed, Swansea. Med. Supt., J. S. I. Skottowe, M.D., D.P.M. Clerk and Steward, J. R. Barnes. Cockett, G.W.R., 1 mile.

MONMOUTHSHIRE.

Monmouthshire Mental Hospital, Abergavenny. Res. Med. Supt., N. R. Phillips, M.D. G.W.R. station, $\frac{1}{2}$ mile, L.M. & S.R., $\frac{1}{2}$ mile.

Newport Mental Hospital, Caerleon. Res. Med. Supt., Dr. M. R. Mackay, M.C. Caerleon, $\frac{1}{4}$ mile.

ABERDEENSHIRE.

Aberdeen City Mental Hospital. Res. Med. Supt., Dr. J. S. Annandale. Newmachar station, $1\frac{1}{4}$ miles.

Aberdeen Royal Mental Hospital. Res. Med. Supt., R. Dods Brown, M.D.; Sec., John A. McConachie, 230, Union Street. Aberdeen station, 1 mile.

ANGUS.

Baldovan Institution, Dundee (for the treatment and education of mental defectives). Res. Med. Supt., D. J. Forbes, M.B., Ch.B. Downfield, 1 mile; Dundee, $4\frac{1}{4}$ miles.

Dundee Mental Hospital, Westgreen, Dundee. Res. Med. Supt., W. Yuach Mackenzie, M.D. Dundee, 3 miles; Liff, $1\frac{1}{2}$ miles.

Dundee Royal Asylum, Gowrie House, Dundee. Med. Off., A. B. Dalgetty, M.D. Sec., J. Murray Wilkie, 27, Bank Street, Dundee.

The Royal Asylum, Montrose. Res. Med. Supt., C. J. Shaw, M.D. Dabton, 1 mile; Montrose, 3 miles.

ARGYLLSHIRE.

Argyll and Bute District Mental Hospital, Lochgilphead. Res. Med. Supt., D. Ross, M.B., Ch.B., M.R.C.P.E. By rail to Gourock, thence by steamer to Ardrishaig, $2\frac{1}{2}$ miles, also motor bus service direct from Glasgow (85 miles), twice daily.

AYRSHIRE.

Glengall Hospital, Ayr. Med. Supt., Douglas McRae, M.D., F.R.C.P. Ayr station, 2 miles.

BANFFSHIRE.

Ladysbridge Mental Hospital, Ladysbridge. Res. Med. Supt., Dr. George M. Bell. Ladysbridge station, 300 yards.

DUMFRIESSHIRE.

Crichton Royal, Dumfries. Res. Med. Supt., Dr. C. C. Easterbrook. Dumfries, 1 mile.

EAST LOTHIAN.

East Lothian District Asylum, Haddington. Supt., Miss Jean Sinclair. Med. Off., H. H. Robarts, M.D. Haddington station, 10 minutes.

FIFESHIRE.

Fife District Asylum, Cupar. Res. Med. Supt., William Boyd, M.B., Ch.B. Springfield station, N.B.R., $\frac{1}{2}$ mile.

INVERNESS-SHIRE.

District Asylum, Inverness. Res. Med. Supt., William McWilliam, M.D., D.P.M. Inverness, 2½ miles.

LANARKSHIRE.

District Mental Hospital, Woodilee, Glasgow. Res. Med. Supt., H. Carro, L.R.C.P. & S. Lenzie station, 1 mile; Glasgow, 8 miles.

Glasgow District Mental Hospital, Gartloch, Gartcosh. Res. Med. Supt., Dr. A. M. Dryden. Garnkirk station, 1 mile.

Glasgow Royal Mental Hospital, Gartnavel. Res. Med. Supt., Dr. Angus MacNiven.

Hawkhead Mental Hospital, Glasgow, S.W.2. Res. Med. Supt., Dr. J. H. MacDonald. Crookston station.

Kirklands Mental Hospital, Bothwell, Glasgow. Res. Med. Supt., Wm. M. Buchanan, M.B. Bothwell and Fallside stations, ½ mile; Glasgow, 9 miles.

Lanark District Asylum, Hartwood, Lanarkshire. Res. Med. Supt., Dr. N. T. Kerr. Hartwood, L.M.S. station, ¼ mile.

MIDLOTHIAN

Edinburgh District Mental Hospital, Bangour Village, West Lothian. Res. Med. Supt., W. M. McAlister, F.R.C.P.E. Uphall, L. & N.E.R., 2 miles.

Mavisbank Hospital, Polton (formerly *New Saughton Hall*). Med. Director, W. M. C. Harrowes, M.D., D.P.M. (Lond.). Polton, 5 minutes; Loanhead, 10 minutes' walk.

Midlothian and Peebles District Asylum. Res. Med. Supt., James H. C. Orr, M.D. Rosslynlee, 1 mile; Edinburgh, 12 miles.

Royal Edinburgh Hospital for Mental and Nervous Disorders, Morningside. Res. Phys. Supt., Professor D. K. Henderson, M.D., F.R.C.P. Edinburgh, 1½ miles.

MORAYSHIRE.

Morayshire Mental Hospital, Elgin. Res. Supt., Miss Annie A. Kintoch. Vis. Med. Off., Dr. A. C. Macdonald. Elgin, 1½ miles.

PERTHSHIRE.

District Asylum, Murthly, Perth. Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

James Murray's Royal Mental Hospital, Perth (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D., F.R.C.P.E. Perth station, under 2 miles.

RENFREWSHIRE.

Craw Road Asylum, Paisley. Res. Med. Off., Miss Enid Dixon, M.B., Ch.B. Paisley, 1 mile.

Dykebar Mental Hospital, Paisley. Res. Med. Supt., R. D. Hotchkis, M.D. Paisley, 2½ miles.

Smithston Asylum, Greenock. Res. Med. Supt., Wm. Leggett, M.D. Greenock West, 1½ miles; Ravenscraig, ½ mile.

The Mental Hospital, Riccartbar, Paisley. Med. Supt., Mary R. Knight, M.A., M.B., Ch.B. Paisley West, ¾ mile.

ROXBURGHSHIRE.

Roxburgh, Berwick, and Selkirk District Asylum, Melrose. Res. Med. Supt., Patrick Steele, M.D. Melrose, ¾ mile.

St. Andrews, Stirches, Hawick. Vis. Phys., A. N. Bruce, M.D. Licensee, Sister Mary Agnes. Hawick station, 1 mile.

STIRLINGSHIRE.

District Mental Hospital, Larbert, Stirling. Med. Supt., R. B. Campbell, M.D. Larbert, L.M. & S.R., 1½ miles.

ANTRIM.

Antrim Mental Hospital, Antrim. Res. Med. Supt., Dr. Arthur R. Boyd. Antrim station, 1½ miles.

Belfast Mental Hospital, Purdysburn, near Belfast. Res. Med. Supt., Dr. S. J. Graham. Belfast, G.N.R. station, 3 miles.

ARMAGH.

County Mental Hospital, Armagh. Res. Med. Supt., Dr. Dora E. Allman. Armagh station, ½ mile.

The Retreat, Armagh. Apply, Res. Med. Supt., or Capt. A. D. Allen. Richhill station, 1½ miles, or Armagh station, 3 miles.

CARLOW.

District Mental Hospital, Carlow. Res. Med. Supt., Dr. T. A. Greene. Carlow, ¼ mile.

CLARE.

Clare Mental Hospital, Ennis. Res. Med. Supt., Dr. F. O'Mara. Ennis, 2 miles.

CORK.

Cork District Mental Hospital, Cork. Res. Med. Supt., Dr. B. F. Honan. Cork station, 1½ miles.

Lindville Private Mental Hospital, Cork. Proprietress, Mrs. E. Osburne. Res. Med. Off., Dr. J. C. Osburne. Cork station, 2 miles by tram.

DONEGAL.

Donegal District Mental Hospital, Letterkenny. Res. Med. Supt., J. C. Martin, L.R.C.P. & S.I., L.M. Letterkenny and Lough Swilly Rly., or Strabane & Letterkenny Rly., 1 mile.

DOWN.

Down Mental Hospital (855 beds), *Downpatrick*. Res. Med. Supt., M. J. Nolan, L.R.C.P.I. and S.I., J.P. *Downpatrick*, 1 mile.

DUBLIN.

Bloomfield, Morehampton Rd., Dublin. Med. Off., H. T. Bewley, M.D.

Farnham House and Maryville, Finglas, Co. Dublin. Res. Med. Supt., H. R. C. Rutherford, F.R.C.S.I., D.P.H. Motor bus from Dublin, 2 miles.

See also Advt., p. 115
Grangegorman Mental Hospital, Dublin. Res. Med. Supt., Dr. J. O'Connor Donelan. Also *Portrane Branch, Donabate, Co. Dublin*. Dep. Res. Med. Supt., Dr. Stanley Blake. *Donabate station*, 1½ miles.

Highfield, Drumcondra (for ladies); *Hampstead, Glasnevin* (for gentlemen). Res. Med. Supt., Wm. N. Eustace, L.R.C.P.I. and S.I. By rail, Dublin.

See also Advt., p. 83
House of St. John of God, Stillorgan, Dublin. Res. Phys., Dr. J. J. Boland and Dr. F. Whitaker. *Stillorgan station*, ½ mile.

St. Patrick's Hospital, James's Street, Dublin. Res. Med. Supt., Dr. R. R. Leeper. Branch Asylums at *St. Edmonds-bury, Lucan*. *See also Advt., p. 108*

St. Vincent's Mental Hospital, Fairview, Dublin. Vis. Physicians, John Murphy, F.R.C.P.I., and F.X. Callaghan, F.R.C.P.I. Apply to the Superioress.

Stewart Institution and Hospital for Mental Diseases, Palmerstown, Co. Dublin. Res. Med. Supt., G. H. Keene, M.D. *Kingsbridge, Dublin*, 3 miles.

Verville Clontarf, Dublin. Med. Sup., P. D. Sullivan, F.R.C.S.I. *Clontarf*, 1 mile.

GALWAY.

Ballinasloe Mental Hospital, Ballinasloe. Res. Med. Supt., John Mills, M.B. *Ballinasloe station*, 2 miles.

KERRY.

District Mental Hospital, Killarney. Res. Med. Supt., F. N. M. O'Sullivan, B.A., M.B., B.Ch., D.P.M. *Killarney*, ¾ mile.

KILKENNY.

District Mental Hospital, Kilkenny. Res. Med. Supt., Dr. P. J. Cassin. *Kilkenny station*, ½ mile.

LIMERICK.

District Mental Hospital, Limerick. Res. Med. Supt., Dr. P. J. Irwin. *Limerick* ½ mile.

LONDONDERRY.

District Asylum, Londonderry. Res. Med. Supt., John Watson, M.C., M.B., B.Ch. *Londonderry*, 1 mile.

MAYO.

Co. Mayo Mental Hospital, Castlebar. Res. Med. Supt., Alfred Sheridan, L.R.C.P. and S.I. *Castlebar*, 1 mile.

MONAGHAN.

Monaghan Mental Hospital, Monaghan. Res. Med. Supt., Dr. T. P. Conlon. *Monaghan*, ½ mile.

QUEENS' COUNTY.

District Mental Hospital, Portlaoighise. Res. Med. Supt., Dr. Pierce Grace. *Portlaoighise*, ¼ mile.

SLIGO.

District Mental Hospital, Sligo. Res. Med. Supt., Dr. John Dunne. *Sligo*, 1½ miles.

TIPPERARY.

District Mental Hospital, Clonmel. Res. Med. Supt., Dr. J. F. Fitzgerald. *Clonmel*, 1 mile.

TYRONE.

Mental Hospital, Omagh. Res. Med. Supt., Dr. J. Patrick. *Omagh*, 2 miles.

WATERFORD.

Bon Sauveur Mental Home, Carriglea, Dungarvan, Waterford (for ladies). Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. D. T. McCarthy. *Dungarvan station*, 3½ miles.

District Mental Hospital, Waterford. Res. Med. Supt., Dr. Alexis FitzGerald. G.S. & W.R., *North station*, 2 miles.

St. Patrick's Private Mental Hospital, Belmont Park, Waterford (for gentlemen). Conducted by the Brothers of Charity. Vis. Phys., Dr. M. Coghlan. *Waterford station*, 1 mile.

WESTMEATH.

District Mental Hospital, Mullingar. Res. Med. Supt., Dr. Laurence Gavin. *Mullingar station*, 1 mile.

WEXFORD.

District Mental Hospital, Enniscorthy. Res. Med. Supt., Dr. Bernard Lyons. *Enniscorthy*, 1 mile.

MENTAL DEFICIENCY ACT, 1913: CERTIFIED INSTITUTIONS AND HOUSES.

Class A.—Certified Institutions. *Class B.*—Institutions approved under Section 37.

Class C.—Certified Houses. *Class D.*—Approved Homes.

BEDFORDSHIRE.

Bronham House, Bronham, near Bedford. For 24 males. Non-Res. Med. Supt., Dr. C. G. Welch. Lay Supt., M. Wallenger. Oakley, 2 miles. (*Class A.*)

BERKSHIRE.

Cumnor Rise, Oxford.—34 females. High-grade feeble-minded. Supt., Miss Evans. (*Class A.*)

BUCKINGHAMSHIRE.

The Manor House Institution, Aylesbury. For 56 males and 43 females. Supt., Miss E. Boughton. Managers, Bucks Mental Deficiency Committee. (*Class A.*) Aylesbury, $\frac{1}{2}$ mile.

Winslow Institution, Winslow.—(For Bucks County cases only.) 8 male, 38 female, adults. Feeble-minded and imbecile. Supt., J. Burden. (*Class B.*)

CHESHIRE.

Ashton House, 26, Village Road, Oxton, Birkenhead. For 64 high-grade patients over 14 years old. Lady Supt., Miss O. M. Wilkinson. (*Class A.*) Woodside, (about 20 minutes by tram).

The Mary Dendy Home, Sandebridge, near Alderley Edge. 425 males and females. Educable mentally defective children under 13 years of age. President, Carey M. Bowden, Esq., J.P. Sec., E. M. Richards, 72, Bridge Street, Manchester. (*Class A.*)

CUMBERLAND.

Dovenby Hall Colony, Cockermouth. For 185, both sexes. Supt., Miss S. J. Bevan. (*Class A.*)

Durran Hill House, Carlisle. 65 females. Feeble-minded. Higher grade. Supt., Sr. B. Purcell. (*Class A.*) Carlisle station, 2 miles.

DERBYSHIRE.

Thornhill, Trowels Lane, Derby. For females. Supt., Miss S. McGarvie. (*Class A.*)

Whittington Hall, Whittington, near Chesterfield. 400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W.1. (*Class A.*)

DEVON.

Royal Western Counties Institution, Starcross. 687 males and females (trainable children and adults). Sec. Supt., C. W. Mayer. (*Class A.*)

Stoke Lyne, Withycombe, Exmouth. 50 males. Managers, Devon County Council Supt., Miss H. E. Darlington. (*Class A.*)

DURHAM.

Monckton Hall Home for Lads, Jarrow-on-Tyne. 79 males. Supt., Mrs. A. H. Piggott. (*Class A.*)

Shotley Bridge Colony, Shotley Bridge, Durham. 279 males, 194 females. Matron Supt., Miss H. L. C. Yates. (*Class A.*) Shotley Bridge, L. & N.E.R., $\frac{1}{4}$ mile.

ESSEX.

Bigods Hall, R. C. Special School, near Dunmow. 61 high-grade boys. Corresponding Manager, Rev. Sr. Rosalie Dunne, Chigwell Convent, Woodford Bridge, Essex. Supt., Sr. J. Scully. (*Class A.*)

Brunswick House, Mistley, Essex. 75 males (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., S. E. Dudley. (*Class A.*)

Etlow House, Church Road, Leyton. 120 high-grade feeble-minded females over 16. Supt., Sr. C. Keogh. (*Class A.*) Leyton, L. & N.E.R., $\frac{1}{4}$ mile.

Royal Eastern Counties Institution Ltd., Colchester. 1800 males and females, all grades. Med. Supt., Dr. F. D. Turner. (*Class A.*)

South Ockenden Colony, South Ockenden, Essex. 84 males, 52 females. Supt., Miss W. S. Butler. (*Class A.*) Ockenden, $\frac{1}{4}$ mile.

The Mutual Sanatorium, Billericay, Essex. 54 males of the middle class Non-Res. Med. Supt., W. Shackleton, M.D. Res. Lay Supt., A. J. Read. (*Class A.*) Billericay, L. & N.E.R., 1 mile.

GLOUCESTERSHIRE.

Brentry Colony, Westbury-on-Trym, Bristol. 367 males over 18 years of age. Res. Med. Supt., G. de M. Rudolf. Henbury station, $1\frac{1}{2}$ miles. (*Class A.*)

Hortham Colony (City and County of Bristol), Almondsbury, near Bristol. 304 males, 304 females. Res. Med. Supt., Walter Wyatt, M.B., B.Ch. (Edin.), D.P.M. (*Class A.*) Patchway, G.W.R., $2\frac{1}{2}$ miles.

Royal Fort Home, St. Michael's Hill, Bristol. 30 females, high-grade mentally deficient. Hon. Sec., Mrs. Murray, 77, Stackpool Rd., Bedminster, Bristol. Lay Supt., Miss Coles. (Class A.) Bristol, 1 mile.

St. Mary's Home, Painswick, Stroud, Glos. 29 females. High-grade feeble-minded. Apply, Lady Supt. (Class A.)

Stoke Park Colony, Hanham Hall, Hanham, near Bristol. 240 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Stapleton, Bristol. 790 patients of both sexes. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.) See also *Advt.*, p. 84

Stoke Park Colony, West Side, Stapleton. 528 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stapleton Institution, Bristol. 100 adult males, 100 females and 40 children. Superintendent, A. F. Waters. (Class B.)

HAMPSHIRE.

Coldeast Colony, Salisbury, near Southampton. 500 both sexes. Vis. Med. Off., Dr. K. W. Mackie. Matron, Mrs. E. K. Bushell. (Class A.)

Mount Tabor, Basingstoke, Hants. Church of England institution for 50 high-grade females over 16 years of age, with annexe for 20 low-grade girls under 16 years of age. Vis. Med. Off., Dr. Kelly. Supt., The Rev. Mother Superior, Sisters of the Transfiguration. (Class A.) Basingstoke, S.R., $\frac{1}{2}$ mile.

St. Mary's Home, Alton. 45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. Non-Res. Med. Supt., Dr. C. V. Payne, Lansdown House. Alton. Supt., The Sister Superior. (Class A.) Alton, 15 minutes.

Tatchbury Mount Colony, West Totton, Southampton. 56 males. Supt., W. M. Worlock. (Class A.)

Arniston School, Boxmoor House, Hemel Hempstead, Herts. 22 patients of either sex. (Class D.) Boxmoor, 10 minutes.

HERTS.

Cell Barnes Colony, St. Albans, Herts. Both sexes. Res. Med. Supt., Dr. N. H. M. Burke. (Class A.) St. Albans (City), 1 mile.

Hillside Spécial School for Mentally Defective Boys, Buntingford. 48 males under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

St. Elizabeth's Home for Epileptics, Much Hadham. 56 children; 104 female adults. Apply to Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

St. Raphael's Colony, Barchin Park, near Potter's Bar, Herts. 93 epileptic and mental defective males over 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

Rowley Lodge, Rowley Green, Barnet. Educational home for 15 very backward boys and girls. Principal, Miss Wall. (Class D.) See also *Advt.*, p. 78

The Middlesex Colony for Mental Defectives, Harper Lane, Shenley, near St. Albans. 639 both sexes. Managers, Middlesex County Council. Res. Med. Supt., Dr. H. E. Beasley. (Class A.) Radlett, L.M. & S.R., 2 miles.

Learesden Mental Hospital, Abbot's Langley, Watford, Herts. 2310 London cases only (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., R. M. Stewart, M.D., F.R.C.P., D.P.M. (Class B.)

KENT.

Leybourne Grange Colony, West Malling. 120 females, 180 males. Med. Supt., Dr. R. Fitzroy Jarrett. (Class A.) Malling, S.R., 2 miles.

Princess Christian's Farm Colony, Hildenborough. 71 certified males, 68 certified females, 18 approved home cases. Managers, National Association for the Feeble-minded. Superintendent, Miss Pitman. (Classes A and D.) Tonbridge, 3 miles.

Darenth Training Colony, near Dartford, Kent. 2260 London cases only (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. K. C. Laing, M.B., B.S., D.P.M. (Class B.)

LANCASHIRE.

Allerton Priory R.C. Special School, Woolton, Liverpool. 123 female educable children. Cor. Manager, Rev. J. Bennett, 93, Shaw Street, Liverpool. Supt., Sister M. B. Pound. (Class A.)

Calderstones, Whalley, near Blackburn. 1364 males, 964 females. Feeble-minded, imbeciles, idiots, and moral defectives. Managers, Mental Deficiency Acts Committee, Lancashire Mental Hospitals Board, Preston. Res. Med. Supt., Frank A. Gill, M.D. (Class A.) Whalley, L.M.S., $1\frac{1}{2}$ miles.

Dovecot Certified Institution, Knotty Ash, Liverpool. 64 females. Supt., Miss F. E. Eyre. (Class A.)

Moss Side State Institution, Maghull, Liverpool. 149 males and 155 females, over 16 years of age and of dangerous or violent propensities. Med. Supt., C. H. G. Gostwyck, M.B. Managers, The Board of Control, Caxton House West, Tothill Street, S.W.1. (*Class A.*) Maghull, L.M. & S.R., $\frac{1}{2}$ miles.

Pontville R. C. Special School, Ormskirk. 121 boys under 16. Mentally defective. Cor. Manager, Rev. J. Bennett, 93, Shaw Street, Liverpool. (*Class A.*)

Royal Albert Institution, Lancaster. 825 of both sexes. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Res. Med. Supt., Dr. W. H. Coupland. Secretary, Samuel Keir. (*Class A.*) See also *Advt.*, p. 84

Seafeld House, Waterloo Road, Seaforth, near Liverpool, 21. 101 male, 134 female, feeble-minded children. Managers, Liverpool City Council, Liverpool. Res. Supt. in Charge, A. Armitage. (*Class B.*) Seaforth station, L.M. & S.R., $\frac{1}{2}$ mile.

LEICESTERSHIRE.

Leicester Frith, Groby Road, Leicester. 120 males, 180 females. Supt., Miss N. Russam. Managers, City of Leicester Mental Deficiency Committee, Alliance Chambers, Horsefair Street, Leicester. (*Class A.*)

LONDON.

South Side Home, Streatham Common, S.W.16. 80 females (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., Miss H. G. Hollyer. (*Class A.*)

The Helping Hand Home, 16, Cathcart Hill, N. 29 females. High-grade mental deficients. Matron, Miss Calch. Managers, Committee; Hon. Sec., Mrs. Geoffrey Russell, J.P., 17, Church Row, Hampstead, N.W.3. (*Class A.*)

St. Teresa's, 97, Belmont Hill, Lewisham. 120 females. Supt., Sister A. Friel. (*Class A.*)

Fountain Mental Hospital, Tooting Grove, Tooting Graveney, S.W.17. 670 low-grade unimprovable children (London cases only, of both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. Nicoll, M.D., C.M., D.P.H. (*Class B.*)

NORFOLK.

Heckingham Institution, Norfolk. For both sexes. Supt., W. L. Hill. (*Class A.*)

MIDDLESEX.

All Souls' Special School, Field Heath House, Hillingdon. 120 educable females under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (*Class A.*)

Bramley House, Clay Hill, Enfield. 50 females. Managers, Middlesex County Council. Supt., Miss A. Swift. (*Class A.*)
St. Raphael's Institution, The Butts, Brentford. 60 females. Supt., Miss A. Dwyer. (*Class A.*)

Walsham Home and Hostel, 64, St. Ann's Hill, Wandsworth. 15 feeble-minded girls. Sec., Sister George, Church Army, 55, Bryanston Street. Marble Arch, W.1. (*Class A.*) Clapham Junction, 5 minutes by train.

Normansfield, Teddington. 150 males and females of all ages. Med. Supt., Dr. R. L. Langdon-Down. (*Class C.*)

See also *Advt.*, p. 86
Alexander House, 117, High Street, Uxbridge. 24 females over 16. Vis. Med. Off., Dr. Black. Lay Supt., Miss A. B. Oswell. (*Class D.*)

Conifers, Teddington. 22 females and 3 male children. Med. Supt., Dr. R. L. Langdon-Down. (*Class D.*)

Trematon, Teddington. 24 males. Med. Supt., Dr. R. L. Langdon-Down. (*Class D.*)

NORTHUMBERLAND.

Prudhoe Hall Colony, Prudhoe-on-Tyne. 422 of both sexes. Supt., Miss N. M. Hawkes. (*Class A.*) Prudhoe station, L. & N.E.R.

NOTTINGHAMSHIRE.

Rampton State Institution, near Retford. Both sexes of violent and dangerous propensities. 652 males, 499 females. Med. Supt., F. E. E. Schneider, M.D., D.P.M. Managers, The Board of Control, Caxton House West, Tothill Street, S.W.1. (*Class A.*)

SOMERSET.

House of Help (Bath Preventive Mission), 112, Walcot Street, Bath. 66 females. Hon. Vis. Med. Off., Dr. D. L. Beath. Supt., Miss H. D. Stegeman. (*Class A.*)

Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol. 260 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (*Class A.*)

Rock Hall House, Combe Down, Bath. 18 males, 20 females. Supt., Miss L. S. Davison. (*Class A.*)

Yatton Hall, Yatton, near Bristol (ancillary premises to Sandhill Park). 76 of both sexes (65 under 16 years, 11 young women). Managers, Somerset County Council, Supt., Miss J. McGill. (*Class A.*)

Sandhill Park, Bishop's Lydeard. 101 females and 60 males, of 16 years and over, and 100 school children under Education Act. Managers, Somerset County Council. Med. Supt., Dr. G. W. J. Mackay. Lady Supt., Miss T. Wood. (*Class A.*)

West End House, Shepton Mallet (ancillary premises to *Sandhill Park*). 129 females of 16 years and over. Managers, Somerset County Council. Med. Supt., Dr. G. W. J. Mackay. Lady Supt., E. B. Stalker. (Class A.)

Cambridge House, Flax Bourton, Bristol (ancillary premises to *Sandhill Park*). 104 males of 16 years and over. Managers, Somerset County Council. Supt., Mr. W. Lombard. (Class A.)

STAFFORDSHIRE.

New Cross Institution, Mental Wards, Wolverhampton. 8 males, 3 females. Managers, County Borough Council of Wolverhampton. Supt., T. D. Rollinson. (Class B.)

Sedgley Poor Law Institution, Burton House, Dudley, Stafford. 50 males, 65 females. Managers, Staffordshire County Council. Master, P. Hopkin. (Class B.)

Stallington Hall, Blythe Bridge, Stoke-on-Trent. 33 males, 44 females. Supt., Miss M. A. Cahill. (Class A.)

SUFFOLK.

Handford Home, Ranelagh Road, Ipswich. 22 high-grade females. Managers, Ipswich Corporation. Supt., Miss D. B. Miller. (Class A.)

St. Joseph's Home, The Croft, Sudbury. 27 high-grade females. Lady Supt., Sister Catherine. (Class A.)

SURREY.

Eagle House, London Road, Mitcham. For females. Supt., Miss M. Blandford. (Class A.)

Ellen Terry National Home for Blind Defective Children, Wray Park Road, Reigate. For both sexes. Matron-Supt., Miss E. M. Cooke. (Class A.)

Farnfield, Horley, Surrey. 141 males of criminal experience or intractable disposition (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt. and Matron, Mrs. Oldfield. Horley, 3 miles.

Royal Earlswood Institution, Redhill. 330 males, 270 females (including small boys). Res. Med. Supt., Dr. S. Langton. Sec., Mr. H. Stephens, 14, Ludgate Hill, E.C.4. (Class A.)

See also Adet., p. 78

The Manor, Epsom, Surrey. 1292 (both sexes). (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., E. S. Littlejohn, M.R.C.S., L.R.C.P. (Class A.)

Caterham Mental Hospital, Caterham, Surrey. 2103 London cases only (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., T. Lindsay, M.D., F.R.C.S., D.P.M. (Class B.)

SUSSEX.

The Hermitage Training Home, Fairwarp, near Uckfield. For females. Supt., Miss M. Walton. (Class A.)

Tabwell Farm, Jarvis Brook, near Crowborough. For males only. Managers, The Guardianship Society, 8, Grand Parade, Brighton. Med. Director, Dr. S. E. Gill. Supts., Mr. and Mrs. T. Wells.

WARWICKSHIRE.

Agatha Stacey Home, Rednal, near Birmingham. 40 females. Non-Res. Med. Supt., Dr. C. Louis Hawkins. Dunedin, Baunt Green. Lay Supt., Miss D. O. Hall. (Class A.) Baunt Green, 3 miles.

Coleshill Hall, near Birmingham. 180 males, 240 females. Res. Med. Supt., Dr. H. Freize Stephens. (Class A.)

Great Barr Park Colony, Great Barr, near Birmingham. 315 males 341 females. Cot and chair cases, both sexes, 27. Res. Med. Supt., Dr. D. M. Macmillan. (Class A.)

Midland Counties Institution, Knowle, near Birmingham. 200 males. Supt., S. H. Thornton. Med. Officer, J. O. Hollick, M.B. (Class A.) Knowle, G.W.R., 10 minutes.

Monyhull Colony, Monyhull Hall Road, King's Heath, Birmingham. 583 males, 660 females. Med. Supt., Dr. A. M. McCutcheon. (Class A.)

Warwickshire Weston Colony, Weston-under-Weatherley, near Leamington Spa. 32 males, 107 females. Supt., A. B. Lano. (Class A.)

WILTS.

Devizes Poor Law Institution. 17 females, 32 males. Managers, Devizes Area Guardians Committee. Supt., N.T. Fear. (Class B.)

Poor Law Institution, Senington, near Trowbridge. 22 males, 36 females. Managers, Trowbridge Area Guardians Committee. Supt., C. H. Taylor. (Class B.)

WORCESTERSHIRE.

Beesford Court Catholic Mental Welfare Hospital, Beesford, near Defford. 250 senior, 130 junior, males. Res. Manager, The Right Rev. Monsignor T. A. Newsome. (Class A.)

YORKSHIRE.

The Kepstern Institution, Kirkstall, Leeds. 40 adult females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss A. Riley. (Class A.)

Meanwood Park Colony, Meanwood, Leeds. 163 males, 268 females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss C. Surtees Wilson. (Class A.)

Mid-Yorkshire Institution. Whisley, York. 214 males. Managers, The Mid-Yorkshire Joint Board. Supt., Capt. J. Brown, I.S.O. (Class A.) Cattal, L. & N.E.R., 10 minutes.

CARMARTHENSHIRE.

Pantglass Hall, Llanfynydd Road, Carmarthen. For 117 females. Supt., Miss M. C. Treharne-Jones. (Class A.)

FLINT.

Coed du Hall, Rhydymwyn, near Mold. For females. Supt., Miss M. P. Elder. Non-Res. Med. Supt., Dr. T. Roberts, D.P.H. (Class A.) Rhydymwyn, Nr. Mold, 1 mile.

GLAMORGANSHIRE.

Hensol Castle, Pontyclun, Glam. 100 males. *Drymma Hall, Skewen, near Neath.* 79 females. Res. Med. Supt., Dr. E. Lewis. (Class A.)

STIRLINGSHIRE.

The Royal Scottish National Institution, Larbert. For 560 pupils of both sexes and all grades. Res. Med. Supt., R. D. Clarkson, M.D., F.R.C.P. Edin. (Classes A and C.) See also Advt., p. 83

INSTITUTIONS AND HOMES FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

* NOTE—Ecclesfield, Staplehurst, is a Roman Catholic Religious Institution.

MALES ONLY.

HERTS.

Dalrymple House, Rickmansworth. Apply to Res. Med. Supt. Rickmansworth station, Joint G.C. and Metropolitan Railway. $\frac{1}{2}$ mile; L.M. and S.R., 1 mile.

WARWICKSHIRE.

Caldecote Hall, Nuneaton. (C.E.T.S. Institution.) Res. Med. Supt., Alfred E. Carver, M.D. Nuneaton, $2\frac{1}{2}$ miles. See also Advt., p. 87

FEMALES ONLY.

KENT.

*Ecclesfield, Staplehurst.** Med. Supt., Dr. A. M. Jamieson. Apply, Mother Superior. Staplehurst, $1\frac{1}{2}$ miles.

SURREY.

Spelthorne St. Mary, Thorpe, near Chertsey. Apply to the Sister Superior, C.S.M.V. Med. Supt., Dr. W. Dale. Virginia Water, 1 mile.

ANTRIM.

The Lodge Retreat, Dundela Avenue, Holywood Road, Belfast. Med. Attend., Muriel Price, M.B., D.P.H. Matron, Miss E. M. Watt. Stations 20-30 minutes by tram.

UNLICENSED HOMES.

DEVON.

Bay Mount, Paignton. Small private home for both sexes. Res. Med. Supt., Dr. Stanford Park.

KENT.

Old Hill House Ltd., Chislehurst. Res. Med. Supt., Dr. E. H. Griffin, D.S.O., M.C., M.R.C.S. Chislehurst station, 4 minutes.

SUFFOLK.

Norwood Sanatorium Ltd., Rendlesham Hall, Woodbridge. Wickham Market station. Telephone and Telegrams: Wickham Market 16. See also Advt., p. 93

SANATORIA FOR TUBERCULOSIS PULMONARY AND NON-PULMONARY

BEDFORDSHIRE.

Daneswood Sanatorium, Woburn Sands. For indigent Jewish patients. Med. Off., Dr. W. A. Barnes. Hon. Sec., Miss Schlesinger, 24, Queen's Court, Queen's Road, W.2. Woburn Sands (L.M. & S.R.) 1½ miles.

The Bedfordshire County Sanatorium, Mogerhanger Park, Sandy. Med. Supt., C. G. Welch, M.D. Sandy station, 2½ miles.

CAMBRIDGESHIRE.

Papworth Village Settlement, Cambridge. Med. Director, Sir Pendrill Varrier-Jones, M.A., F.R.C.P. Huntingdon station, 6 miles; Cambridge, 12 miles.

CHESHIRE.

Baguley Sanatorium, Baguley. For Manchester cases. Res. Med. Supt., H. G. Trayer, M.B., D.P.H. Baguley, 1½ miles.

Cleaver Sanatorium for Children, Heswall. 200 beds. Med. Supt., J. B. Yeoman, M.D. Matron, Miss D. Kelsall. Heswall, 1½ miles.

East Lancashire Tuberculosis Colony and Sanatorium, Barrowmore Hall, Ut. Barrow, Chester. Occupational treatment. Res. Med. Supt., Dr. E. L. Sandiland. Chester, 6 miles.

Nab Top Sanatorium, Marple. For residents of Salford only. Res. Med. Supt., H. M. Fleming, M.D. Rosehill (Marple) station, ½ mile.

CORNWALL.

The Cornish Riviera Sanatorium, Rosehill, Penzance. Med. Supt., Dr. F. Chown. Penzance, 1½ miles.

CUMBERLAND.

Blencathra Sanatorium, Threlkeld. Res. Med. Supt., Dr. W. Goodchild. Threlkeld, L.M. & S.R., 2 miles.

See also Advt., p. 90

DERBYSHIRE.

Derbyshire County Sanatorium, Walton, near Chesterfield. Med. Supt., A. N. Robertson, M.D. Chesterfield, 1½ miles.

DEVONSHIRE.

Devon and Cornwall Sanatorium, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlile Davis, Esq., M.B.E., 5, Princess Square, Plymouth. Res. Med. Off., Dr. A. T. Bettinson. Brent, G.W.R., 2 miles.

Devon County Sanatorium, Hawkmoor, Bovey Tracey. Res. Med. Supt., Dr. J. C. Smyth. Bovey, 3 miles; Lustleigh, 2 miles.

"Whitecliff" Tuberculosis Hospital, Torquay. Med. Supt., Dr. R. L. Midgley. Torre station, 2 miles.

DURHAM.

Felix House, Middleton St. George, Darlington. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, L. & N.E.R., 3 minutes.

Sanatoria of the Durham County Council: Earls House Sanatorium, near Durham. Med. Supt., J. Menzies Cormack, M.B., Ch.B., D.P.H. *Hollywood Hall, Wolsingham.* Res. Med. Supt., J. W. Gray, M.D. Wolsingham station, L. & N.E.R., 1½ miles. *Seaham Hall, near Seaham Harbour.* Res. Med. Supt., Dr. W. C. Pinkney.

Sanatoria of the Durham County Consumption Society. Sec., Mr. F. Forrest, 54, John Street, Sunderland. Vis. Med. Supt., Dr. G. S. Robinson. For men and boys: *Horn Hall, Stanhope.* Med. Off., Dr. J. O'Hara. Stanhope station, 1 mile. For women and children: *The Leazes House, Wolsingham.* Med. Off., Dr. J. F. McConchie. Wolsingham station, ¾ mile.

ESSEX.

Black Nolley Sanatorium, Braintree. Res. Med. Supt., Dr. M. C. Wilkinson. Sec., Clerk of County Council, Shire Hall, Chelmsford. Cressing, 1 mile.

Merivale Sanatorium, Sandon, near Chelmsford. Res. Med. Supt., H. N. Marrett, M.R.C.S., L.R.C.P. Chelmsford station, L. & N.E.R., 3½ miles.

West Ham Sanatorium, Dagenham, for adults: Langdon Hills Sanatorium, Laindon, for children. Med. Supt., Dr. G. M. Mayberry.

GLOUCESTERSHIRE.

Frenchay Park Sanatorium and Orthopaedic Hospital for Bristol Children, Frenchay, near Bristol. Res. Med. Supt., Dr. K. H. Pridie. Under the control of the M.O.H. Dept., Bristol. Staple Hill station, L.M. & S.R., 1½ miles.

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. D. J. Peebles. Leckhampton, 2½ miles; Cheltenham, 3½ miles.

Standish House Sanatorium, Stonehouse. Res. Med. Supt., W. A. Dickson, M.D., M.R.C.P.Ed., F.R.C.S. Stonehouse, G.W.R., 1½ miles; L.M. & S.R., 2½ miles.

The Cotswold Sanatorium, Cranham, Gloucester. Med. Supt., Geoffrey A. Hoffman, B.A., M.B., T.C. (Dub.); Asst. Phys., Margaret A. Harrison, M.B., B.S. (Lond.); Pathol., Edgar N. Davey, M.B., B.Ch.; Cons. Laryng., Cassidy de W. Gibb, F.R.C.S. Edin; Cons. Dental Surg., George V. Saunders, L.D.S., R.C.S., Lond. Cheltenham, Gloucester, or Stroud, all 8 miles.

HAMPSHIRE.

Hants County Council Sanatorium, Chandler's Ford. Res. Med. Supt., Dr. W. J. Hart. Chandler's Ford, 1 mile.

Lisford Sanatorium, Ringwood. Res. Med. Supts., A. de W. Snowden, M.D., and Dr. A. G. E. Wilcock. Ringwood, 3 miles. See also *Advt.*, p. 90

Royal National Hospital for Consumption, Ventnor, Isle of Wight. Med. Supt. Dr. G. Oliver Hempson. Sec., H. R. Rowe, 18, Buckingham Street, Strand, W.C.2. See also *Advt.*, p. 71

Royal National Sanatorium for Consumption and Diseases of Chest, Bournemouth. Sec., A. G. A. Major. Res. Med. Off., D. A. Hutcheson, M.D. Bournemouth Central, 1½ miles; Bournemouth West, ½ mile.

The Firs Home, Bournemouth (for advanced cases of consumption). Hon. Sec., Col. R. F. Anderson. Hon. Treas., A. J. Drewe, Esq. Hon. Med. Offs., C. P. Woodstock, M.D., and L. R. Oliver, M.B., F.R.C.S. Lady Supt., Miss Ingram. Bournemouth Central, ½ mile.

HERTS.

Hertfordshire County Sanatorium, Ware Park, Ware. Res. Med. Supt., Herbert Sharpe, M.R.C.S., L.R.C.P. Ware, 2 miles; Hertford, 2 miles.

Sanatorium of the National Children's Home and Orphanage, Harpenden. Vis. Phys., T. N. Kelynack, M.D., J.P. and A. V. Kelynack, M.R.C.S., L.R.C.P. Principal, Rev. John H. Litten, Highbury Park, London, N.5. Harpenden station, L.M. & S.R. See also *Advt.*, p. 89

HUNTINGDONSHIRE.

Wyton Sanatorium, Huntingdon (Hunts County Council.) Med. Off., Dr. C. B. Moss-Blundell. Huntingdon or St. Ives, 3½ miles.

KENT.

Grosvenor Sanatorium, Ashford. Res. Med. Supt., J. A. Milne, M.B., Ch.B., D.P.H. Ashford Junction, 2 miles.

Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis," Benenden. Res. Med. Supt., Dr. H. Spurrier. Biddenden, 3 miles.

LANCASHIRE.

Broadgreen Sanatorium, Edge Lane Drive, Liverpool, 13. Res. Med. Supt., Dr. F. O. Thomas. Broadgreen station, ½ mile.

Fazakerley Sanatorium, Langmoor Lane, Liverpool, 9. Res. Med. Supt., Walter Crane, M.D., D.P.H. Fazakerley station, ¼ mile.

High Carley Sanatorium (including Oubas House Children's Sanatorium), Ulverston. Res. Med. Supt., G. Leggat, M.B., Ch.B., D.P.H. Ulverston, 2 miles.

Liverpool Sanatorium for Consumptives, Delamere Forest, Frodsham. Sec., W. H. Rayner, Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D., D.P.H. Frodsham or Helsby, L.M. & S. & G.W.R. 3½ miles.

Manchester Hospital for Consumption and Diseases of Throat and Chest, Hardman St., Deansgate, Manchester (Out-patients). Sec., W. Hunt. *St. Anne's Home, Bowdon, Cheshire* (In-patients. Ear, Nose and Throat Dept.). Res. Med. Off., Dr. G. J. Partington. *Crossley Sanatorium, Delamere, Cheshire.* Res. Med. Off., Dr. G. Heathcote. (For poor and working classes, after personal examination at Manchester.)

Strinesdale Sanatorium, Oldham. Med. Supt., Dr. J. B. Wilkinson. Oldham, 2 miles.

Wilkinson Sanatorium for Consumptives, Sharples, Bolton. Med. Off., Dr. W. Rolland. Bolton, 2 miles.

LINCOLNSHIRE.

Holland Sanatorium, Boston. Med. Supt., W. G. Booth, M.D., D.P.H. Boston, 1 mile.

LONDON.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.2. Apply, Secretary.

Royal Chest Hospital, 231, City Road, E.C.1 (Section of the Royal Northern Group of Hospitals). Res. Phys., Dr. I. O. Thorburn. Apply, Secretary.

Clare Hall County Sanatorium, South Mimms, Barnet. Res. Med. Supt., A. C. Tabois, M.D. Sec., The Clerk, Guildhall, Westminster, S.W.1. Potter's Bar station, 3 miles.

Middlesex County Sanatorium, Harefield. Res. Med. Supt., Dr. J. R. McGregor. Sec., Clerk to the County Council, Guildhall, Westminster, S.W.1. Denham station, 3 miles.

NORFOLK.

Kelling Sanatorium, Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt station, 1½ miles.

Mundesley Sanatorium, Mundesley. Res. Med. Supts., S. Vere Pearson, M.D., Andrew J. Morland, M.D., and E. C. Wynne-Edwards, M.B., F.R.C.S. (Edin.). Mundesley, 1 mile. *See also Advt., p. 91*

The Children's Sanatorium, Incorporated, near Holt. Vis. Med. Off., Dr. H. F. Skrimshire. Hon. Sec., Mrs. C. Munro, Carnegie House, 117, Piccadilly, W.1.

NORTHAMPTONSHIRE.

Creation Sanatorium, Creation, Northampton. Res. Med. Supt., E. T. W. Starkie, M.A., B.Ch., M.R.C.S., L.R.C.P. Brixworth, L.M. & S.R., 3 miles.

NORTHUMBERLAND.

Children's Sanatorium, Stanington. Res. Med. Supt., Dr. Elsie F. Farquharson, M.A. Matron, Miss I. Campbell. Stanington station, 2 miles.

The Newcastle-on-Tyne Sanatorium, Barrasford. Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, L. & N.E.R., 4 miles.

Wooley Sanatorium, Hexham. Res. Med. Supt., Dr. R. Cunningham. Corbridge, 5 miles.

NOTTINGHAMSHIRE.

Ransom Sanatorium, Rainworth, near Mansfield (Notts County Council). Res. Med. Supt., Dr. C. L. Crawford Crowe. Mansfield, 3 miles.

OXFORD.

Berks and Bucks Joint Sanatorium, Peppard Common. Res. Med. Off., Dr. Esther Carling. Reading, 6½ miles.

SHROPSHIRE.

Cheshire Joint Sanatorium, Salop. Res. Med. Supt., Dr. Peter W. Edwards. Market Drayton, 4½ miles.

King Edward VII Memorial Sanatorium, Shirlett, near Broseley. Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

SOMERSETSHIRE.

Nordrach-upon-Mendip, Blagdon, near Bristol. Res. Med. Supt., Gordon Tippet. M.B., M.R.C.S., L.R.C.P.

St. Michael's Home for Pulmonary Tuberculosis, Azbridge. For members of the Church of England. Med. Off., Dr. St. John Kemm. Apply, Sister-in-charge.

SUFFOLK.

Normanston Hospital, Oulton Broad, Lowestoft. Med. Supt., M. A. MacDonald. M.C., M.B., Ch.B.

East Anglian Sanatorium for private patients, *Maltings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium, Nayland.* Med. Supt., Dr. Jane Walker, C.H., J.P., LL.D. Bures station, L. & N.E.R., 3½ miles; Colchester, 8 miles.

SURREY.

Brompton Hospital Sanatorium, Frimley. Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.

Burrow Hill Sanatorium Colony, St. Catherine's Road, Frimley. For youths between 14 and 19 years. Res. Med. Supt., Dr. Alex. Hill Macpherson. Frimley station, 1½ miles.

Church Army Sanatorium for Pre-tubercular Boys, Heath End. Ages 16 to 19. Med. Off., Dr. W. B. Vaile. Sec., Capt. Hanmore. Church Army, 55, Bryanston Street, W.1. Aldershot, 1½ miles.

Prior Place Sanatorium, Heatherside, Camberley. Res. Med. Supt., Dr. H. O. Blanford. Camberley, 2 miles.

Surrey County Sanatorium, Milford. Res. Med. Supt., Dr. R. J. Allison. Milford station, S.R., ½ mile.

SUSSEX.

Darvell Hall Sanatorium, Robertsbridge (East Sussex County Council). Res. Med. Off., Dr. J. R. Dingley. Robertsbridge, S. R., ¾ mile.

Eversfield Chest Hospital, West Hill, St. Leonards. Res. Phys., Dr. E. J. Maxwell. West St. Leonards, S.R.; West Marina, S.R., within 5 minutes' walk.

Fairlight Sanatorium, Hastings, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Miss D. M. Fenn. Med. Supt., Dr. N. F. Stallard. Hastings, tram, about 15 minutes.

King Edward VII Sanatorium, Midhurst. Res. Med. Off., Geoffrey O. Todd, M.B., Ch.M., M.R.C.P.; 1st Asst., Edward M. Turner, M.R.C.S., L.R.C.P.; 2nd Asst., Hugh Ramsay, M.B., B.S., M.R.C.S. L.R.C.P. Midhurst, 4 miles.

Municipal Sanatorium, Brighton (for Brighton townfolk only—pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H., Royal York Buildings, Brighton. Brighton Central station, 1½ miles.

Rudgwick Sanatorium, Rudgwick. Vis. London Phys., Dr. Annie McCall. Rudgwick station, 7 minutes.

WARWICKSHIRE.

City Sanatorium, Yardley Green Road, Small Heath, Birmingham 9. Res. Med. Supt., Dr. G. B. Dixon. Stechford, L.M. & S.R.

WESTMORLAND.

Westmorland Sanatorium, Meathop, Grange-over-Sands. Res. Med. Supt., J. Munro Campbell, M.B., Ch.B., D.P.H. Grange-over-Sands station, 2 miles.

WILTS.

Winsley Sanatorium, Winsley, near Bath. Res. Med. Off., A. J. P. Alexander M.D. (Belf.), M.R.C.P. (Ire). M.R.C.P. (Lond.)). Limply Stoke station, 1 mile.

WORCESTERSHIRE.

King Edward VII Memorial Sanatorium, Knightwick, near Worcester. Free to County patients. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick, $1\frac{1}{2}$ miles.

Prestwood Sanatorium, Stourbridge. Res. Med. Supt., Dr. J. Stevenson, M.C. Stourbridge, 3 miles.

Romsley Hill Sanatorium, Halesowen. Res. Med. Supt., Dr. P. J. Bodington. Birmingham Corporation Sanatorium. Halesowen, $4\frac{1}{2}$ miles.

YORKSHIRE.

Bierley Hall Sanatorium, Bierley Lane, Bradford. For 60 men and women. Res. Med. Supt., Dr. R. S. Donaldson. Bradford, 3 miles.

Eastby Sanatorium for Boys, Skipton. Res. Med. Supt., Dr. Catherine Arnott. Emsay station, 2 miles.

Eldwick Sanatorium, Bingley (West Riding County Council school for phthisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

Gateforth Sanatorium, near Selby, Leeds. Res. Med. Supt., D. A. C. Meek. *Leeds Sanatorium for Consumptives, Killingbeck; and Children's Sanatorium, "The Hollies," Westwood, Leeds.* Hambleton, L. & N.E.R., $1\frac{1}{2}$ miles.

Middleton Sanatorium, near Ilkley. Ben Rhydding, $1\frac{1}{2}$ miles.

The City Sanatoria, Sheffield; Crimicar Lane Sanatorium (males); *Commonside Sanatorium* (females); *Winter Street Sanatorium* (both sexes); *Nether Edge Sanatorium* (both sexes and children). Clinical Tuberculosis Off., H. Midgley Turner, M.D., D.P.H. Sheffield, L.M. & S.R., $\frac{1}{2}$ miles.

Wensleydale Sanatorium, Aysgarth. Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth, $\frac{1}{2}$ mile, via Northallerton, L. & N.E.R., and marsdale Junction, L.M. & S.R.

See also Advt., p. 92

ANGLESEY.

Penhesgyn-y-Gors Sanatorium for Children, Menai Bridge (King Edward VII Welsh National Memorial Association). Med. Off., Dr. H. Grey-Edwards. Matron, Miss Williams. Menai Bridge, 3 miles.

CARMARTHENSHIRE.

West Wales Sanatorium, Llanbyther. The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. Henry A. Ross. Llanbyther station, 3 miles.

CARNARVONSHIRE.

Pendyffryn Hall Sanatorium, Penmaen-mawr. Res. Phys., Dennison Pickering, M.D.(Camb), and J. W. Costello, M.D., F.R.C.S. Penmaenmawr, L.M. & S.R., $1\frac{1}{2}$ miles.

See also Advt., p. 91

DENBIGHSHIRE.

Abergele Sanatorium. For Manchester cases. Med. Supt., J. E. Geddes, M.D. Abergele, 2 miles.

Vale of Clewyd Sanatorium, Llanbedr Hall, Ruthin. Res. Med. Supt., H. Morriston Davies, M.D. Ruthin station, 2 miles.

See also Advt., p. 91

GLAMORGANSHIRE.

Adelina Patti Tuberculosis Hospital, "Craig-y-nos," Pen-y-cae, Swansea. Res. Med. Supt., Dr. L. R. Clark. Craig-y-nos, 2 miles.

ABERDEENSHIRE.

Tor-na-Dee Sanatorium, Murtle. Res. Med. Supt., Dr. J. M. Johnston. Murtle, $\frac{1}{2}$ mile.

See also Advt., p. 91

ANGUS.

Sidlaw Sanatorium, Auchterhouse, near Dundee. 80 beds for children. (In connection with Dundee Royal Infirmary.) Med. Supt., H. J. C. Gibson, M.D. Vis. Phys., W. E. Foggie, D.S.O., M.D. Vis. Surg., John Anderson, D.S.O., F.R.C.S.E. Matron, Miss Ellen Norris. Sec., W. F. Ferguson. Auchterhouse station, $1\frac{1}{2}$ miles.

ARGYLLSHIRE.

Argyll County Sanatorium, Benvoulin, Oban. 40 beds. Vis. Med. Off., Duncan MacDonald, J.P., M.D., M.B., C.M.

AYRSHIRE.

Ayrshire Sanatorium, Glenafton, New Cumnock. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, $2\frac{1}{2}$ miles.

EAST LoTHIAN.

East Fortune Sanatorium, East Fortune. Res. Med. Supt., Chas. Cameron, M.D. East Fortune, $\frac{1}{2}$ mile.

DUMFRIESSHIRE.

St. Fechan's Sanatorium, Ecclefechan, by Lockerbie. For Boys. Res. Med. Off., Dr. F. A. Collington. Ecclefechan station, 1 mile.

FIFESHIRE.

Sanatorium for Tuberculosis, Kirkcaldy. Med. Supt., Dr. G. W. McIntosh. Sec., The Town Clerk. Kirkcaldy, 1 mile.

INVERNESS-SHIRE.

Grampian Sanatorium, Kingussie. Res. Med. Supt., Felix Savy, M.D., J.P. Kingussie, $\frac{1}{2}$ mile.

Inverness-shire Sanatorium, Invergarry, Aberchalder. Med. Supt., J. Kirtion, M.C., M.A., M.D. Aberchalder, 2 miles.

PEEBLESSHIRE.

Manor Valley Sanatorium, Peebles. Med. Off., W. M. Martin, M.B., M.R.C.P.E. Peebles, 4 miles; Lyne, $1\frac{1}{2}$ miles.

RENFREWSHIRE.

Consumption Sanatoria of Scotland, Bridge of Weir.—Res. Med. Supt., E. J. Peill, M.B., Ch.B., F.R.C.S.E. Sec., Wm. A. Findlay. Bridge of Weir, 2 miles.

ROSS-SHIRE.

Seaforth, Sanatorium, Margburgh. Med. Off., Dr. W. McLean.

ANTRIM.

Belfast Municipal Sanatorium, Whiteabbey. Res. Med. Supt., P. S. Walker, M.D., B.Ch., B.Sc., D.P.H. Whiteabbey, 50 yards.

Forster Green Hospital for Consumption and Chest Diseases, Forthreda, Belfast. Med. Supt., B. R. Clarke, M.D. Sec., J. Osborne, 99-103, Scottish Provident Buildings, Belfast. Belfast, 2 miles.

CORK.

Cork County and City Sanatorium, Heatherside, Buttevant. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

DOWN.

Rostrevor Sanatorium, Warrenpoint. Phys., Dr. J. A. O'Tierney. Apply Secretary.

DUBLIN.

Peamount Sanatorium, Newcastle, Dublin. Res. Med. Supt., A. Barry, F.R.C.P.I. Lucan, 2 miles.

WICKLOW.

The Royal National Hospital for Consumption for Ireland, Newcastle, Wicklow. Res. Med. Off., C. Denys Hanan, M.D. G.S. Rlys. to Newcastle, Co. Wicklow, 2 miles.

FRANCE.

Trespoe, Pau (Basses-Pyrenees). Clinic for Pulmonary Diseases. Med. Director, Dr. W. Jullien. Pau, 2 kilometres.

See also Advt., p. 95

SWITZERLAND.

Montana Hall (The British Sanatorium), Montana-sur-Sierre. Res. Med. Supt., Hilary Roche, M.D., M.R.C.P.

See also Advt., p. 93

Park Sanatorium (formerly Sanatorium Turban), Davos-Platz. Res. Med. Supt., F. Bauer, M.D. Davos-Platz, 10 minutes.

See also Advt., p. 88

The Schatzalp Sanatorium, Davos-Platz. Res. Med. Supt., Edward C. Neumann, M.D. Davos-Platz station and Schatzalp funicular.

See also Advt., p. 96

HYDROPATHIC ESTABLISHMENTS.

CHESHIRE.

Hoylake Hotel (late West Kirby Hydro Hotel), West Kirby. Telephone: Hoylake 86. Kirby Park station, 5 minutes. Apply Manageress. See also Advt., p. 104

DERBYSHIRE.

Rockside Hydropathic, Matlock. Res. Phys., Dr. C. R. L'Estrange Orme and Dr. N. C. Selater. Matlock, L.M. & S.R., $\frac{1}{2}$ mile.

Smedley's Hydropathic, Matlock. Res. and Vis. Physicians. Matlock station, $\frac{1}{2}$ mile; omnibus. See also Advt., p. 101

GLOUCESTERSHIRE.

The Bristol Hydropathic and Electrotherapeutic Establishment, College Green, Bristol. Res. Phys., A. T. Spoor, M.A., M.R.C.S., L.R.C.P. Res. Med. Supt., W. J. Spoor, M.B., M.R.C.S.

HAMPSHIRE.

The Bournemouth Hydro, 10 Durley Gardens, Bournemouth West. Res. Med. Supt., L. T. Rose-Hutchinson, M.D. Bournemouth West station, $\frac{1}{2}$ mile.

See also Advt., p. 102

Linden Hall Hydro, Bournemouth. Proprietors, The Exton Hotels Co. Ltd.

LANCASHIRE.

Kenworthy's Hydropathic, Southport. Res. Phys., Dr. I. E. Kenworthy. Chapel Street or Lord Street stations.

Smedley Hydro-Hotel, Southport, (Birkdale Park). Southport or Birkdale stations, 5 minutes.

LEICESTERSHIRE.

Leicester Hydro Establishment, Museum Square, Leicester. Prof. Dr. T. Timson, D.Sc., F.P.C., London. L.M. & S.R., 3 minutes.

WILTSHIRE.

West of England Hydropathic, Limply Stoke, near Bath. Apply the Secretary.

YORKSHIRE.

Craiglands Hydro, Ilkley. Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S., L.R.C.P., M.R.C.S.

See also Advt., p. 102

Harlow Manor Hydro, Harrogate. Manageress, Mrs. Baxter. Harrogate station, 1 mile.

Cairn Hydropathic Company Ltd., Ripon Road, Harrogate. Apply, Manager. Harrogate station, $\frac{1}{2}$ mile.

The Harrogate Hydropathic Company Ltd., Harrogate (Medical Baths). Manager, Morton Chance. Harrogate station, $\frac{1}{2}$ mile.

MORAYSHIRE.

Cluny Hill Hydropathic, Forres. Vis. Phys., Dr. John C. Adam. Forres, 1 mile.

PEEBLESHIRE.

Peebles Hotel-Hydropathic, Peebles. Med. Supts., Drs. A. Temple and G. E. Ord. Peebles L.M. & S.R. & L. & N.E.R., $\frac{1}{2}$ mile.

PERTHSHIRE.

Strathearn Hydro, Crieff. Res. Med. Supt., T. Gordon Meikle. M.B., C.M. Crieff station, 1 mile; Perth 17 miles.

CORK.

St. Ann's Hill Hydropathic, St. Ann's Hill, near Blarney, Cork. Res. Phys., Dr. R. H. Barter. Blarney North, 3 miles; Blarney South, $\frac{1}{4}$ mile.

NURSING ASSOCIATIONS AND INSTITUTIONS FOR NURSES

LONDON.

Cavendish Temperance Male Nurses' Corporation Ltd., 54, Beaumont St., W.1. (23, Upper Baggot St., Dublin; 28, Windsor Terrace, Glasgow; and 176, Oxford Road, Manchester.) See also Advt., p. 82

Male Nurses' Association, 29, York Street, Baker Street, W.1. Sec., W. J. Hicks. See also Advt., p. 81

New Mental Nurses' Co-operation, 139, Edgware Road, W.2. Lady Supt., Miss Eva R. Crook. See also Advt., p. 79

The Nurses' Association, 29, York Street, Baker Street, W.1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks.

See also Advt., p. 81

The Temperance Male and Female Trained Nurses' Co-operation, 45, Beaumont Street, W.1. Sec. H. S. Sturgess. See also Advt., p. 80

YORKSHIRE.

The Retreat, Trained Nurses' Department, York. Apply to the Matron. See also Advt., p. 80

PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, AND INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

CHESHIRE.

The David Lewis Colony, Alderley Edge (for sane epileptics), and Colthurst House School (for epileptic boys and girls). Res. Director, Richard Handley, M.B., D.P.M. Alderley Edge, 3 miles. See also Advt., p. 84

DEVONSHIRE.

Ockenden Convalescent Home, Warren Road, Torquay. Hon. Med. Off., Eric Catford, M.R.C.S., L.R.C.P. Lady Supt., Miss Glover. Torre and Torquay stations, 1 mile.

GLOUCESTERSHIRE.

Dorset House, Clifton Down, Bristol. Functional nervous disorder—ladies and girls. Apply, Elizabeth Casson, M.D., D.P.M. See also Advt., p. lviii

HERTS.

The Archer Nerve Training Colony, Langley Rise, Ltd., King's Langley. (For functional nervous disorders). Vis. Physicians. Apply, Secretary. King's Langley (L.M. & S.R.), 1 mile. See also Advt., p. 86

LANCASHIRE.

Home for Epileptics, Maghull, Liverpool, (for sane epileptics), and Chilton Home (certified as a special school for 82 epileptic children). Med. Officer, C. V. H. Nesbitt, M.D. Sec., C. E. Grisewood, A.C.A., 20, Exchange Street East, Liverpool, 2. See also Advt., p. 80

LONDON.

Cæthillian Maternity Home, 85 and 87, Fordwych Road, Cricklewood, N.W.2. Matron, Miss E. Wyatt. Kilburn Brondesbury, Metropolitan Rly., 5 mins.

Institute of Ray-Therapy and Electro-Therapy, 152-154, Camden Road, N.W.1. Hon. Med. Director, William Beaumont, M.R.C.S., L.R.C.P. Hon. Sec., Winifred Beaton, M.A.

Swedish Institute and Clinique, 108, Cromwell Road, S.W.7. For Massage, Medical Electricity, and Medical Gymnastics. Gloucester Road (Dist., Met. and Piccadilly Tube), 2 minutes. Phone, West 1010. See also Advt., p. 82

Woodside Hospital, Woodside Avenue, Muswell Hill, N.10. (St. Luke's Foundation.) For functional nervous disorders. Physician in charge, R. W. Gilmour, M.R.C.P. *See also Advt., p. 85*

MIDDLESEX.

Bowden House, Harrow-on-the-Hill (for functional nervous disorders). Med. Supt., Henry L. Wilson, M.D., M.R.C.P. Sudbury Hill, Harrow, L. & N.E.R., 15 mins. walk. *See also Advt., p. 86*

Oxhey Grove Ltd., Oxhey Grove, Hatch End. For early mental conditions in both sexes. Res. Phys., Dr. Margherita M. Lilley. Hatch End (L.M. & S.R. & Bakerloo), 1 mile. *See also Advt., p. 86*

SOMERSETSHIRE.

Lansdown Hospital and Nursing Home, Bath. For gout, rheumatism, and physical infirmities. Phys., Dr. Wells-Beville. L.M. & S.R. or G.W.R. stations, 1 mile. *See also Advt., p. 79*

CARNARVONSHIRE.

The Dr. Garrett Memorial Home for Convalescent Children, Morfa Drive,

Conway. For boys and girls. 200 beds (86 open-air). Proprietress, Mrs. C. E. M. Garrett. Conway, L.M. & S.R., $\frac{3}{4}$ mile. *See also Advt., p. liv*

DENBIGHSHIRE.

Ruthin Castle, Ruthin. Private Hospital for internal Diseases. Senior Phys. E. I. Spriggs, M.D., F.R.C.P. Ruthin, $\frac{1}{4}$ mile. *See also Advt., p. liii*

PERTHSHIRE.

Gilgal Hospital, Perth. For neuro-pathic and psychopathic disorders. Phys. Supt., W. D. Chambers, M.A., M.D., F.R.C.P.E. *See also Advt. p. 86*

FRANCE.

Clinique Médicale du Château de Garches, Garches, near Paris. Nervous disorders, nutrition, etc. Director, Dr. Garand. *See also Advt., p. liv*

"La Colline," Saint-Antoine-Nice, France. Disorders of digestion, nerves, etc. Director, Dr. Perski. *See also Advt., p. liv*

PRINCIPAL BRITISH SPAS.

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

THE BRITISH SPAS FEDERATION.

Bath (Somerset).—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 107 miles from London. Average rainfall 31 inches. Climate mild and equable.

Waters.—The springs are hyperthermal (120°), radio-active, diuretic.

Therapeutic Indications.—Gout, arthritis, spondylitis, fibrositis, nervous debility, toxic neuritis, certain heart conditions, constipation and colitis, various skin diseases, chronic forms of rhinitis, pharyngitis and laryngitis, obesity, gravel, and hepatic dysfunction.

Baths.—A thoroughly equipped bathing establishment; including deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation, and the Bath thermal vapour treatment; also electrotherapy.

Hotel.—The Pulteney Hotel (*see p. 100*).

Nursing and Baths.—Lansdown Hospital and Nursing Home (*see p. 79*).

Bridge of Allan (Stirlingshire).—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 36 inches. Climate mild and equable.

Waters.—Natural saline mineral springs.

Therapeutic Indications.—Rheumatism, gout, sciatica, many chest diseases, chronic affections of the liver, stomach, and bowels, and some diseases of the skin.

Baths.—Excellent suite of baths and electro-therapeutic apparatus.

Buxton (Derbyshire).—1000 to 1200 feet above sea level; 168 miles from London; 23 miles from Manchester. Sheltered from north and east winds. Very bracing air.

Waters.—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless; also chalybeate springs.

Therapeutic Indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, mucocombranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anæmic conditions, and convalescence from prolonged illness.

Baths.—Establishments, including St. Ann's Well (Pump Room), recently modernized.

Cheltenham (Gloucestershire).—184 feet above sea level; 98 miles from London. Climate soft and mild. Average rainfall 27 inches. Sunshine 1486 hours.

Waters.—Four springs: the Fieldholme or twin saline, containing nearly equal parts of magnesium sulphate and sodium sulphate; the Lansdowne or sodium sulphate saline, the chief ingredients of which are sulphate and chloride of sodium; the Pittville or alkaline saline; and the Chadnor or magnesium and calcium saline.

Therapeutic Indications.—The toxic and congestive states associated with liver and stomach disorders, constipation, obesity, glycosuria, and gout.

Baths.—Including douche and massage.

Droitwich Spa (Worcestershire).—140 feet above sea level; 2½ hours by express train from London (Paddington), 19 miles from Birmingham, 7 from Worcester. Rainfall 25 inches. Mean maximum temperature 59° F., mean minimum temperature 43° F.

Waters.—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level at a temperature of about 45° F., and is heated by introducing steam.

Therapeutic Indications.—Chronic muscular and articular rheumatism, arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, some heart disorders, sprains and injuries of tendons, muscles, joints, etc.

Baths.—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Homburg baths, etc.

Hotel.—Raven and Park Hotels (see p. 98); Worcestershire Brine Baths Hotel (see p. 103).

Boarding Establishment.—Ayrshire House (see p. 103).

Harrogate (Yorkshire).—350–600 feet above sea level, 203 miles from London. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 30 inches. Mean temperature 47° F.

Waters.—Celebrated for the medicinal properties of its different mineral waters—sulphurous, chalybeate, alkaline, and saline.

Therapeutic Indications.—Gout and other metabolic disorders, functional liver derangement and early cases of cirrhosis, cholelithiasis and cholecystitis, chronic skin diseases, neuritis and arthritis, mucous colitis, chronic dysentery, constipation, and intestinal toxæmias, anæmia, nervous diseases, hyperpiesis, and the sequelæ of tropical diseases.

Baths.—In the bathing establishments all the latest treatments are given.

Mineral Water.—'Aqua-peria' aperient mineral water is bottled at Harrogate by Camwall Ltd. from their own Spring (see p. 163).

Leamington Spa (Warwickshire).—195 feet above sea level; 87 miles from London. Equable and mild climate. Average rainfall 25 inches. Mean annual temperature 49°. Westerly winds prevail.

Waters.—Hypertonic saline water; aperient and diuretic.

Therapeutic Indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia, and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, conditions of increased vascular tension, and chronic interstitial nephritis.

Baths.—Turkish, massage douches, saline, Plombières, paraffin wax, Berthollet, electric and swimming. (See also p. 97).

Llandrindod Wells (Radnorshire).—750 feet above sea level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 40 inches. About 170 miles distant from London.

Waters.—Saline, sulphur and radium-sulphur, magnesium, lithia saline, and chalybeate. Slightly aperient and strongly diuretic.

Therapeutic Indications.—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia.

Baths.—Sulphur, immersion, needle, and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; fango and peat baths; whirlpool and agitation baths; and most electrical treatments.

Strathpeffer Spa (Ross-shire, N.B.).—150 to 300 feet above sea level. Sheltered practically on all sides, except the N.E. Prevailing wind S.W. Bracing air. Average rainfall 31 inches. Mean annual temperature 45° F. About 584 miles from London.

Waters.—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic Indications.—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, and neurasthenia.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, Plombières, radiant heat (electric), and high-frequency current.

Trefriw Wells (Carnarvonshire).—5½ hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type. The pump-room and baths are open all the year, but the principal season is March to the end of October.

Waters.—Two varieties: (1) The stronger sulpho-chalybeate, and (2) the milder sulpho-chalybeate. Used internally, and externally in the form of baths.

Therapeutic Indications.—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

OTHER BRITISH SPAS.

Church Stretton (Salop).—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches. Mean temperature 44°.

Waters.—Said to be the purest in Great Britain.

Therapeutic Indications.—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork, and convalescence after illness or operation.

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe, 211 miles from London, 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 39 inches. Mean annual temperature 47° F. Bracing and invigorating moorland air.

Waters.—The water-supply obtained from springs is remarkably pure, bright, and sparkling. Chalybeate waters. Saline.

Therapeutic Indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydrotherapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Hydropathic Establishment.—Craiglands Hydropathic (*see p. 102*).

Llangammarch Wells (Breconshire).—600 feet above sea level. 213 miles from London. Well protected from the east, and prevailing wind is S.W.

Water.—Saline, containing the chlorides of barium (6½ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles.

Therapeutic Indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Malvern (Worcestershire).—500 feet above sea level. A health centre of long repute, 122 miles from London. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 30 inches. Mean temperature about 49° F. Exceptional sunshine records.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon, with high eliminative qualities. The water is dispensed in a new Pump Room adjoining the Winter Gardens and Priory Park.

Therapeutic Indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases. (*See also p. 100.*)

Matlock (Derbyshire).—143 miles from London. South-west aspect—well sheltered from the north and east. Climate free from extremes of heat and cold. The water pure and soft. Season all the year. The Matlock system of hydropathic treatment is carried out in all its branches. The principal Hydros are installed with latest electric baths and appliances.

Therapeutic Indications.—Gout, rheumatism, arthritis, neuritis, sciatica, lumbago, neurasthenia, colitis, cholecystitis, cardiac and renal diseases.

Hydropathic Establishment.—Smedley's Hydropathic (*see p. 101*).

At Matlock Bath there are thermal mineral springs of long-established repute, rising at 68° F.

Peebles (Peeblesshire, N.B.).—About 500–600 feet above sea level. One hour from Edinburgh and 382 miles from London. Average rainfall, about 38 inches. Bracing climate, but sheltered from the north winds.

Waters.—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

Therapeutic Indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

Torquay (Devonshire).—199½ miles from London. Non-stop express trains run daily, the journey occupying only 3½ hours. There are through carriages from Northern and Midland cities. The most beautifully situated marine health resort in the British Isles. Well sheltered from the north. The sunshine record is one of the highest in the country. Average rainfall, 34.2 inches. Mean temperature, 51.9°. Sunshine record averages 1742.9 hours.

Climate.—Mild, soft, and equable. It is specially beneficial for many pulmonary, bronchial, and laryngeal conditions, for mild cases of nephritis, for delicate children, and for aged and debilitated persons. Those unable to withstand the rigour of the winter in other British health resorts derive great benefit from residence in Torquay. The season is all the year round.

Baths.—The Marine Spa baths are very modern and complete. They are ideally situated. The recognized forms of spa treatment are available, and fully certificated assistants are retained upon the staff for electrical and other treatments. A medical consultation room is available for the convenience of medical practitioners and patients. There is a large warm sea-water swimming bath with modern filtration plant. Salt-water baths, concentrated brine baths, seaweed baths, and Dartmoor peat packs are a speciality, and are indicated in the treatment of muscular rheumatism, fibrositis, sciatica, rheumatoid arthritis, osteo-arthritis and gout. (*See also p. liii.*)

Tunbridge Wells (Kent).—400 feet above sea level, 34 miles from London. Climate is tonic and invigorating. Prevailing winds W. and S.W. Average rainfall, about 32.3 inches. Mean temperature, 49°.

Waters.—A weak, non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic Indications.—Waters indicated in anæmia, chlorosis, and allied conditions.

Woodhall Spa (Lincolnshire).—50 feet above sea level. 130 miles from London. Average rainfall 24 inches. Mean annual temperature 48°.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic Indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders.

Spa Baths.—These include immersion, shower, undercurrent, and local douches; Aix and Vichy douche massage; Nauheim, electric, and Schnee baths; Dowsing radiant heat and light baths.

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 Edinburgh Medical Journal—Monthly 4/- net; 40/- per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.
 General Practice—Quarterly, 12/- per annum—83-91, Great Titchfield Street, W.1.
 Glasgow Medical Journal—Monthly 3/-; 30/- per annum—70, Mitchell Street, Glasgow.
 Guy's Hospital Gazette—Fortnightly 9d.; 10/- per annum—Ash & Co. Lim., Henry Street, Bermondsey Street, S.E.1.
 Guy's Hospital Reports—Quarterly, 12/6—Guy's Hospital, London, S.E.1.
 Helminthology, Journal of—Quarterly, 25/- vol.—Keppel Street, W.C.1.
 Homeopathic Journal, British—Quarterly 5/-—83-91, Great Titchfield Street, W.1.
 Hospital, The—Monthly 6d.; 7/6 per annum—12, Grosvenor Crescent, S.W.1.
 Hospital Diary, The—Yearly 5/6—G. R. C. Brook & Co., 27, Old Bond Street, W.1. (See *Advertisement*, p. 23.)
 Hospitals Year Book—Yearly 10/- net—Central Bureau of Hospital Information, 12 Grosvenor Crescent, S.W.1. (See *Advertisement*, p. 53.)
 Hygiene, Bulletin of—Monthly 2/6; 21/- per annum—Keppel Street, W.C.1.
 Hygiene, Journal of—Quarterly 14/-—Cambridge University Press, Fetter Lane, E.C.4.
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 Irish Journal of Medical Science (Official Organ of the Royal Academy of Medicine in Ireland)—Monthly 2/6—Parkgate Printing Works, Dublin. (See *Advt.*, p. 46.)
 Irish Medical and Hospital World—Monthly, 7/6 per annum—268, North Circular Road, Dublin.
 Jennerian—Monthly (Supplement to "The Medical Officer")—Sent post paid to Members of the Association of Public Vaccinators—36, Whitefriars Street, E.C.4.
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 Lancet—Weekly, 42/- per annum—7, Adam Street, W.C.2. (See *Advertisement*, p. 45.)
 Laryngology and Otology, Journal of—Monthly 4/-; 40/- per annum—Headley Brothers, 109, Kingsway, W.C.2. (See *Advertisement*, p. 22.)
 Laryngoscope, The—Monthly, 35/- per annum—Baillière, 8, Henrietta Street, W.C.2.
 Liverpool Medico-Chirurgical Journal—Twice yearly, 2/6—Mount Pleasant, Liverpool.
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- Medical Forum—Monthly 2/-; 21/- per annum—83-91, Great Titchfield Street, W.1.
- Medical Officer—Weekly 1/-; 42/- per annum (and Supplement monthly: The Jennerian)—36-38, Whitefriars Street, E.C.4. (*See Advertisement, p. 51.*)
- Medical Press and Circular—Weekly 6d.; 21/- per annum—8, Henrietta Street, W.C.2 (*See Advertisement, p. 49.*)
- Medical Psychology, British Journal of—Quarterly, 30/- net per vol.—Cambridge University Press, Fetter Lane, E.C.4.
- Medical Register—Yearly 21/-—Constable, 10, Orange Street, W.C.2.
- Medical and Dental Students' Register—Yearly 7/6—10, Orange Street, W.C.2.
- Medical Times—Monthly 6d.—8 & 9, St. Alban's Place, Islington, N.1.
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- Prescriber—Monthly, 2/-; 20/- per annum—13, Glencairn Crescent, Edinburgh, W. (*See Advertisement, p. 26.*)
- Psycho-analysis, International Journal of—Quarterly, 30/- vol.—8, Henrietta Street, W.C.2.
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 Ulster Medical Journal—Quarterly 5/- per annum—Official Organ of the Ulster Medical Society, the Medical Institute, College Sq. North, Belfast. (*See Advertisement, p. 54.*)
 University College Hospital Magazine—Oct. to March, 6d. each—Bale, 83-91, Great Titchfield Street, W.1.
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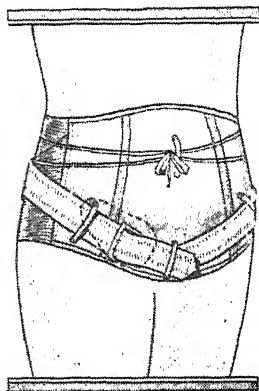
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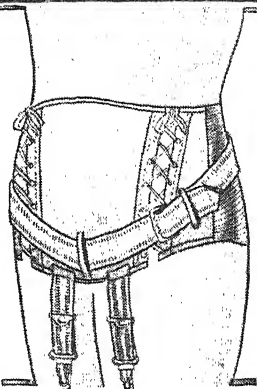
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Alliance Assurance Co. Ltd., Bartholomew Lane, E.C.2. Gen. Man., A. Levine P	1824	49/1	65/1	90/10	23 786,240
Atlas Assurance Co. Ltd., 92, Cheapside, E.C.2. Gen. Man., C. H. Falloon. Act. and Life Man., William Penman P	1808	48/1	63/7	88/4	10,147,740
Australian Mutual Provident Society, 73-76, King William St., E.C.4. Man. for U.K., A. W. Nicholls, A.I.A. M	1849	48/2	64/5	89/10	86,258,112
Beacon Insurance Co. Ltd., 142, Edmund St., Birmingham, 3. Man. Director, H. J. Greening. London Office, Insurance House, Kingsway, W.C.2 P	1883	47/8	63/1	89/1	3,515,695
Britannic Assurance Co. Ltd., Life, Fire, Accident, and General Insurances, Broad St. Corner, Birmingham. Chairman, Jno A. Jefferson, F.I.A. Sec., J. M. Laing, F.I.A., F.F.A. Further particulars see opposite page P	1866	47/11	65/-	93/4	24,000,000
British Equitable Assurance Co. Ltd., Royal Exchange, E.C.3. Man., Douglas A. Coleman P	1854	46/-	61/10	87/3	1,693,120
British General Insurance Co. Ltd., 66, Cheapside, E.C.2. Man. Dir., Norman M. Walker P	1901	49/5	64/10	90/7	1,033,749
†British Widows' Assurance Co. Ltd., 1, Old St., E.C.1. Joint Gen. Mans., Robert J. Jamieson and F. E. Crabtree P	1902	—	—	—	639,897
Caledonian Insurance Co., 19, George Street, Edinburgh. General Manager, F. J. Cameron, F.F.A., F.I.A., London (City) Office, 5, Lothbury, E.C.2. P	1805	45/5	64/6	90/7	7,378,490
Canada Life Assurance Co., 2, St. James's Square, S.W.1. Man., J. R. Wandless, F.I.A. P	1847	48/5	65/4	94/2	45,588,907
Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W.1, and 8, King William Street, E.C.4. Gen. Man. and Actuary, A. H. Fowell P	1821	48/7	66/-	95/10	12,092,701
Colonial Mutual Life Assurance Society Ltd., 4, St. Paul's Churchyard, E.C.4. Man., Ernest A. Cawdron. Sec., J. S. Gillespie M	1873	43/9	65/1	89/10	15,076,443
Commercial Union Assurance Co. Ltd., 24, Cornhill, E.C.3. Act., H. Brown, B.A., F.I.A. P	1861	46/3	63/3	92/2	21,565,713
Confederation Life Association (of Canada), Bush House, Aldwych, W.C.2. Man., G. T. Varney. P	1871	48/-	64/9	94/3	20,369,400
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. Man., J. P. Jones M	1867	47/4	63/1	90/1	6,588,753
Eagle Star & British Dominions Insurance Co. Ltd., 1, Threadneedle St. E.C.2.; Life Dept., 32, Moorgate, E.C.2. Man. Dir., Sir Edward M. Mountain, Bart., J.P. P	1807	43/1	63/10	89/5	*11,406,143
Equitable Life Assurance Society, 19, Coleman Street, E.C.2. Act. and Man., W. Palin Elderton M	1762	54/-	63/-	92/-	8,448,723
Equity & Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. Man. and Sec., A. C. Thorne, F.I.A. P	1844	46/3	63/3	90/8	12,951,361

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General Life Assurance Company, General Buildings, Adwyck, W.C.2. <i>Gen. Man., S. Norie-Miller</i> P	1837	47/1	62/8	88/3	3,176,503
Gresham Life Assurance Society Ltd., 184-190, Fleet St., E.C.4. <i>Man. and Sec., J. H. Stebbing</i> P	1848	46/8	61/10	87/3	9,067,540
Guardian Assurance Co. Ltd., 68, King William St., and 21, Fleet Street, E.C. <i>Gen. Man., A. C. Sweet, Act. and Sec., W. A. Osborne</i> .. P	1821	43/10	64/6	89/3	6,785,502
Law Union and Rock Insurance Co. Ltd., 7, Chancery Lane, W.C. <i>Sec., A. H. Shrewsbury, F.I.A.</i> P	1806	47/-	62/3	87/4	10,978,616
Legal & General Assurance Society Ltd., 10, Fleet St., E.C. <i>Gen. Man., W. A. Workman, F.I.A.</i> P	1836	—	—	—	24,064,680
Life Association of Scotland, 82, Princes St., Edinburgh, 2. <i>Man. and Act., A. G. R. Brown. Sec., Francis J. McGregor, London, 28, Bishopsgate, E.C.2.</i>	1838	48/11	64/10	91/1	7,366,782
Liverpool and London and Globe Insurance Co. Ltd., 1, Dale Street, Liverpool, 2. <i>Gen. Mans., F. J. Williams and J. Dyer Simpson. London Office, 1, Cornhill, E.C.3</i> P	1836	49/4	65/3	90/9	11,057,161
London & Scottish Assurance Corporation Ltd., King William Street House, Arthur Street, E.C.4. <i>Man., Frank B. Cooke. Sec., A. G. H. Emslie.</i> P	1862	48/9	64/9	91/2	4,908,834
London Assurance, The, 1, King William St., E.C. <i>Act. and Life Man., A. G. Paton, F.I.A.</i> .. P	1720	49/-	64/8	90/2	*7,123,372
London Life Association Ltd., 81, King William St., E.C.4. <i>Act. and Man., A. W. Evans, F.I.A.</i> M	1806	44/-	59/3	84/-	25,072,959
Marine and General Mutual Life Assurance Society, 48, Fenchurch Street, E.C.3. <i>Act. and Sec., Howard T. Cross, F.I.A.</i> M	1852	48/10	65/-	91/6	3,585,190
Medical Sickness Annuity & Life Assurance Society, Ltd., 300, High Holborn, W.C. <i>Man. and Sec., Bertram Sutton, F.C.I.I.</i> M	1884	40/2	55/3	80/-	450,822
Mutual Life and Citizens' Assurance Co. Ltd. (of Australia), Brettenham Ho., 1, Lancaster Place, W.C.2. <i>Man., Alex. S. Sellar, M.A., F.F.A.</i> P	1886	48/9	65/3	89/9	19,568,892
National Mutual Life Assurance Society, 39, King St., Cheapside, E.C.2. <i>Act. and Man., G. H. Recknell, F.I.A., F.F.A.</i> M	1830	48/4	63/7	89/6	5,981,170
National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C.2. <i>Man., J. T. Campbell</i> M	1860	46/8	61/6	87/2	37,000,000
National Provident Institution, 48, Gracechurch St., E.C.3. <i>Act. and Sec., H. E. Melville, F.I.A.</i> M	1835	50/2	66/3	91/1	*10,917,996
North British & Mercantile Insurance Co. Ltd., 61, Threadneedle St., E.C.2 and 64, Princes St., Edinburgh. <i>Man. Dir., London, Sir A. Worley, Bt., C.B.E. Man., Edinburgh, J. E. Bell.</i> .. P	1800	49/10	66/1	91/11	34,816,068
Northern Assurance Co. Ltd., 1, Moorgate, E.C.2. <i>Gen. Man., K. K. Peters.</i> P	1836	47/2	63/6	90/3	7,436,578
Norwich Union Life Insurance Society, Norwich. <i>Gen. Man. and Act., H. G. Wilton, F.I.A.</i> London, 48, Fleet St., E.C.4. <i>Further particulars see page 14</i> M	1808	48/4	65/7	94/3	37,031,782
Pearl Assurance Co. Ltd., 252, High Holborn, W.C.1. <i>Joint Man. Dir., J. Pierce and H. H. Austin, F.I.A.</i> P	1864	40/-	65/-	92/-	C8,265,057
Phoenix Assurance Co. Ltd., Phoenix House, King William St., E.C.4, 7, St. James's Street, S.W.1, and 187, Fleet Street, E.C.4. <i>Gen. Man., R. Y. Sketch. Further particulars see page xlviii.</i> .. P	1782	48/11	64/11	90/10	16,296,395

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Provident Mutual Life Assurance Association, 25 to 31, Moorgate, E.C.2. <i>Man. and Act.</i> , C. R. V. Coutts, F.I.A. M	1840	43/8	64/8	90/4	8,695,032
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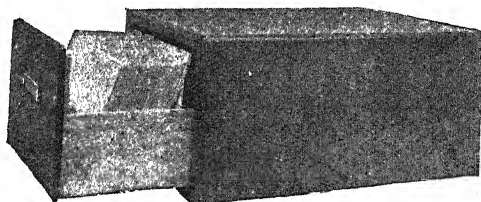
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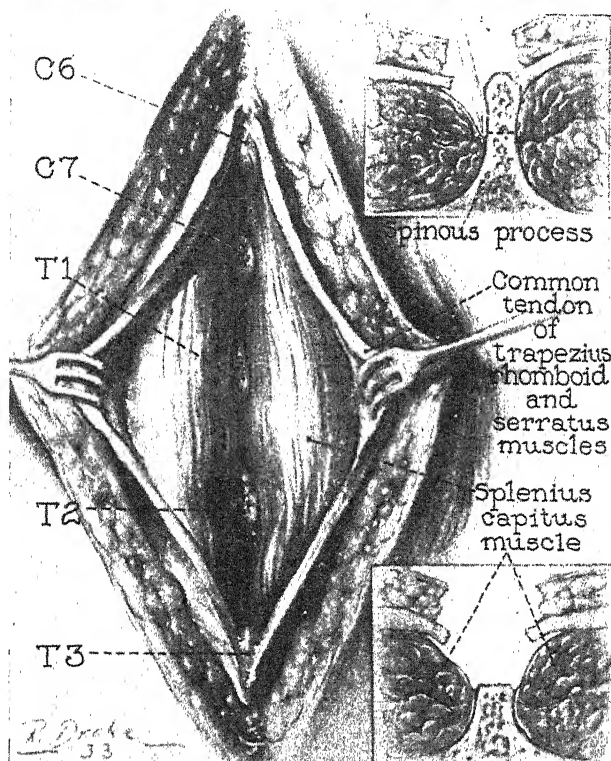
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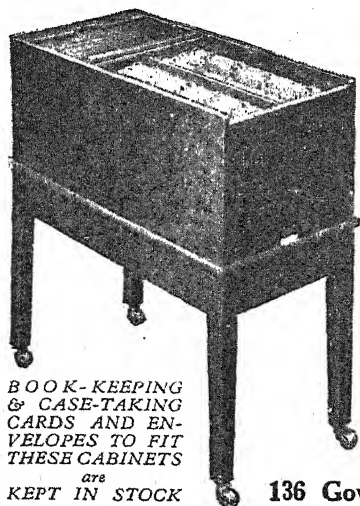
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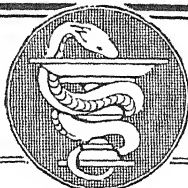
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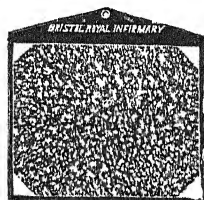
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SATURDAY	..	2 p.m.	MEDICAL REGISTRAR		

The Hospital is the recognized centre in London for Post-Graduate Study of Diseases of the Skin. Teaching is carried out under the auspices of the

LONDON SCHOOL OF DERMATOLOGY.

Staff of Lecturers:—

Chairman: DR. J. M. H. MACLEOD.

H. W. BARBER, M.B., F.R.C.P.	..	Guy's Hospital
H. T. BARRON, M.D., M.R.C.P.	..	Westminster Hospital
R. T. BRAIN, M.D., M.R.C.P.(Lond.)	..	St. John's Hospital
H. CORSI, M.A., M.B., B.Ch.(Camb.), F.R.C.S.(Eng.)	..	St. John's Hospital
S. ERNEST DORE, M.D., F.R.C.P.	..	Westminster & St. John's Hospitals
G. B. DOWLING, M.D., M.R.C.P.	..	St. Thomas's & St. John's Hospitals
J. A. DRAKE, M.D., F.R.C.P.	..	King's College Hospital
W. N. GOLDSMITH, M.A., M.D.(Camb.), M.R.C.P.(Lond.)	..	University College and St. John's Hospitals
A. M. H. GRAY, C.B.E., M.D., F.R.C.P., F.R.C.S.	..	University College Hospital
W. GRIFFITH, M.B., M.R.C.P.	..	St. John's Hospital
H. D. HALDIN-DAVIS, M.B., M.R.C.P., F.R.C.S.	..	Royal Free Hospital
E. GRAHAM LITTLE, M.D., F.R.C.P.	..	St. Mary's Hospital
H. MACCORMAC, C.B.E., M.D., F.R.C.P.	..	Middlesex Hospital
J. M. H. MACLEOD, M.D., F.R.C.P.	..	Charing Cross & St. John's Hospitals
W. J. O'DONOVAN, O.B.E., M.D., M.R.C.P., M.P.	..	London Hospital [Hospitals
A. C. ROXBURGH, M.D., F.R.C.P.	..	St. Bartholomew's and St. John's
H. C. G. SEMON, M.D., M.R.C.P.	..	Royal Northern Hospital
W. KNOWSLEY SIBLEY, M.D., M.R.C.P.	..	St. John's Hospital
M. SYDNEY THOMSON, M.D., M.R.C.P.	..	King's College Hospital
J. E. M. WIGLEY, M.B., M.R.C.P.	..	Charing Cross & St. John's Hospitals

Lectures and Demonstrations are given regularly during the Winter and Summer Sessions. Instruction is given daily in the Out-Patient Department as above. Special classes or individual teaching can be arranged in the Pathological Department. For fees and further particulars apply to the Dean or Secretary.

LEONARD G. R. TURPIN, F.C.C.S., *Secretary.*

J. E. M. WIGLEY, M.B., *Dean.*

ST. MARY'S HOSPITAL MEDICAL SCHOOL

(University of London)

TERMS BEGIN in JANUARY, APRIL, and OCTOBER.

EXCEPTIONAL SITUATION.

The situation of the Hospital and Medical School is unique, for while it is adjacent to a large poor district with a population of 500,000, it is also within a few minutes' walk of Kensington Gardens and an extensive residential district, in which students can live, and so avoid a daily wearisome journey to and from their work. Recent structural alterations include two new operating theatres and 75 additional beds.

RE-BUILDING OF THE MEDICAL SCHOOL.

Approximately £250,000 has been spent in re-building the Medical School and Laboratories. The New Buildings are now in use. Apart from the Laboratories, Class-rooms, and Theatres for all the subjects in the Curriculum, they include a Library, Restaurant, Students' Club, Billiard room, full sized Swimming Bath, Squash Rackets Court, Gymnasium, Boxing ring, and an underground Garage for fifty Cars.

SPECIAL CLINICAL FACILITIES.

The formation of Clinical Units in Medicine and Surgery has been an important advance in connection with the Clinical teaching, and this has been further developed by the affiliation for teaching purposes of several of the Hospitals in the neighbourhood, bringing up the total number of beds, available for teaching, to 1000. By agreement with Queen Charlotte's Lying-in Hospital, all students of St. Mary's attend a short course of instruction there, without extra fee, before entering upon their duties in the Maternity District of St. Mary's.

INSTITUTE OF PATHOLOGY AND RESEARCH.

The Institute of Pathology and Research, under the directorship of Sir Almroth Wright, F.R.S., embraces seven departments, the heads of which are members of the Honorary Staff of the Hospital.

RESEARCH STUDENTSHIPS.

A considerable sum is devoted annually to research, and a part of this is applied to the upkeep of Research Scholarships, designed to enable students recently qualified to learn the technique of research work.

ENTRANCE SCHOLARSHIPS.

All Entrance Scholarships are awarded annually by nomination on the lines of the Rhodes' Scholarships.

The Geraldine Harmsworth Scholarship (£200) open to Oxford or Cambridge Students, and other University Scholarships, of the value of £200 each, are awarded annually, by nomination, to students of British or Colonial Universities who have completed their examination in Anatomy and Physiology.

APPOINTMENTS AFTER QUALIFICATION.

Numerous appointments are open to newly qualified members of the Medical School. Six House Physicians (eight months), Ten House Surgeons (six to eight months), and Four Resident Obstetric Officers (six months) are appointed annually. Two Resident Anaesthetists (six months), £150 per annum, Four Casualty House Surgeons (six months), £100 per annum, with board and residence. Two Medical Registrars and Surgical Registrar, £200 per annum, with partial board. Obstetric Registrar and Radium Registrar, each £50 per annum, with partial board.

In addition to the above, Five Assistants to the Medical and Surgical Units are appointed from time to time, with salaries ranging from £400 to £750 per annum.

ATHLETIC GROUND.

The Athletic Ground (10 acres) is situated at North Wembley, and can be reached in 20 minutes from the Medical School. A large pavilion has been erected at a cost of £3,000.

The Illustrated Prospectus can be obtained from the School Secretary, St. Mary's Hospital, Paddington, W.2.

C. M. WILSON (M.C.), M.D., F.R.C.P., Dean.

FOUNDED
1866

BEDS
88

Free and Paying Patients received in both In- and Out-Patient Departments. The latter is open every week-day except Saturday, at 2 p.m.

SUPPORTED
BY
VOLUNTARY
CONTRIBUTIONS

HOSPITAL

FOR

EPILEPSY

AND

PARALYSIS

and other diseases of
the Nervous System

MAIDA VALE
LONDON

INCORPORATED
1900

Special Departments :

Massage and Electrical Treatment
Swedish Remedial Exercises

X-Ray
Pathological
Ear, Nose & Throat
Dental
Ophthalmic
Psychological
Psychiatric

20 Private Wards
6 Pay Beds

H. W. BURLEIGH
Secretary

GORDON HOSPITAL FOR RECTAL DISEASES

VAUXHALL BRIDGE ROAD, LONDON, S.W.1.

FOUNDED 1884.

Chairman—H. SCOTT DENNINGTON, Esq. Bankers—Messrs. Hoare & Co., 37, Fleet Street

45 BEDS.

HONORARY MEDICAL STAFF.

Consulting Surgeons.—Edgar Hughes, Esq., F.R.C.S.; P. Maynard Heath, Esq., M.S., F.R.C.S.
Surgeons.—W. Ernest Miles, Esq., F.R.C.S.; Peter L. Daniel, Esq., F.R.C.S.; A. Lawrence Abel, Esq., M.S., F.R.C.S.; Eric Crook, Esq., F.R.C.S.

Anæsthetists.—F. J. Lawson, Esq., M.B.; Howard Jones, Esq., M.B.; F. de Caux, Esq., M.R.C.S., L.R.C.P.; Ronald Jarman, Esq., M.R.C.S., L.R.C.P.

Resident Medical Staff.—One House Surgeon.

Matron.—Miss M. L. Burnett.

Operations Monday to Friday. The practice of the Hospital is free to Medical Men and Students. Out-patients seen on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays at 2 p.m. Tuesdays at 6 p.m. All treatment is free. In-patients pay according to their means for maintenance.

PRIVATE WARDS.

A chief feature of the Hospital is to provide for sufferers whose means are unequal to the cost of private treatment, and who yet are not fit subjects for a Free Hospital.

CAPT. HUBERT F. REW, Secretary.

KING'S COLLEGE HOSPITAL

DENMARK HILL, LONDON, S.E.5

School of Instruction in RADIOGRAPHY, RADIOTHERAPY
and CLINICAL PHOTOGRAPHY for the Training of Technical
Assistants in X-RAY and RADIUM DEPARTMENTS.

The School is under the supervision of HUGH DAVIES, M.A., M.R.C.S., D.M.R.E.,
Director of the Radiographic Department, who is assisted by a Staff of Qualified Teachers.

For particulars apply to the Principal: Miss E. L. FRANKLIN, M.R.C.S., L.R.C.P., D.M.R.E.

COUNTY OF LONDON.

THE MAUDSLEY HOSPITAL

DENMARK HILL, S.E.5.

Medical Supt. - EDWARD MAPOTHER, M.D., F.R.C.P., F.R.C.S.

THIS HOSPITAL, organized by the London County Council on the lines of the combined Neurological and Psychiatric Clinics of the Continent and America, represents the first provision of its kind by a public body in this country. Its objects are:—

- (a) Research into the pathology and treatment of Nervous and Mental Disorders;
- (b) Instruction of Medical Students, and advanced post-graduate courses in Psychological Medicine;
- (c) Facilities for diagnosis of difficult cases;
- (d) **TREATMENT** of all forms of Nervous Disorders (both organic and functional), including early and recoverable forms of mental disturbance.

Admission as in-patients for psychoses is limited to cases of good prognosis, or of particular value for research or teaching, except in very special cases for diagnosis.

Approval by the Medical Superintendent is an indispensable preliminary.

Treatment is entirely on a voluntary basis. Every in-patient is required to sign an application form for admission, and is entitled to leave within 24 hours of notifying desire to do so. Restriction of liberty while in Hospital is reduced to a minimum.

The special features of treatment at this Hospital for mental disturbances include (1) Complete absence of association with the certified insane; (2) Careful separation, from admission, of the quiet from restless cases; (3) A Medical Staff sufficiently numerous for modern individual psycho-therapy; (4) All means of physical treatment; (5) The services of eminent specialists in various branches of medicine and surgery; (6) The co-operation of a Pathological Department under Dr. F. L. GOLLA, ensuring application of the most modern methods; (7) A very numerous, highly educated, and experienced nursing staff, almost entirely women.

OUT-PATIENTS are seen at 2 p.m. (Men on Mondays and Thursdays, Women on Tuesdays and Fridays). The Children's Clinic is held on Mondays and Fridays at 10 a.m. All types of nervous and mental disorder are eligible for treatment in this Department.

IN-PATIENTS: Accommodation includes—

- (a) 200 Beds in wards and separate rooms of the Maudsley Hospital itself.
- (b) 35 Beds in wards and separate rooms in an Annexe at King's College Hospital.
- (c) 13 Private rooms (for Ladies) in the Maudsley Hospital, with special sitting rooms and dietary.

TERMS:

(a and b) £5 a week, but in case of patients with a legal settlement in the County of London a less sum may be charged according to means.

(c) £6 6s. a week. (£5 a week as from and including 1st April, 1935.)

All communications should be addressed to the *Medical Superintendent*.

ROYAL NORTHERN GROUP OF HOSPITALS

6,014 In-Patients, and 338,102 Out-Patient Attendances Annually.

Royal Northern Hospital, Holloway, N.7 - - - 286 Beds

Recognised by the Examining Board of the Royal College of Physicians and Surgeons as a place of study during the Fifth Year of the Medical Curriculum. Thirty Special Departments are maintained. Re-equipped Light and X-ray Departments. Maternity Department, Contributory Wards, General Wards, St. David's Wing with 66 beds for private patients, in private rooms, with separate Operating Theatres for the Wing, private Sitting Rooms and Sun Rooms.

Royal Chest Hospital, City Road, E.C.1. - - - 85 Beds

For treatment of all Diseases of the Heart and Chest (Cases of Tuberculosis are admitted for diagnosis only).

Grovelands Hospital (Recovery), Southgate, N.14. - - - 60 Beds

For reception of patients from above Hospitals.

Reckitt Convalescent Home, Clacton-on-Sea - - - 35 Beds

Maternity Nursing Association, Myddelton Square, E.C.1, and 235 Camden Road, N.7. - - - 466 Beds

For District Midwifery work with Ante-Natal and Infant Welfare Clinics.

FUNDS ARE URGENTLY NEEDED.

Post Graduate Instruction

Special Courses are held in Medical and Surgical and special subjects, and are open to all medical practitioners free of charge. The Lectures are advertised beforehand in the Medical Journals.

Special Courses in Anaesthetics

3 Months—3 Guineas; 6 Months—4 Guineas.

Clinical Assistantships are available in all departments of the Hospital. Clinical Clerkships and Pathological Clerkships for a period of 3 months are available. Fees—2 Guineas.

School for Radiographers

Courses lasting 12 to 15 months commence in April and October for the training of Radiographers.

Further particulars may be obtained from: Fees—25-30 Guineas.

Gilbert G. Panter, Secretary, Royal Northern Hospital, Holloway, N.7.

The Royal Dental Hospital of London

SCHOOL of DENTAL SURGERY *(University of London)*

LEICESTER SQUARE, LONDON, W.C.2.

Students are admitted for the curriculum for the B.D.S. Degree, and the L.D.S. Diploma in October, January and May.

HOSPITAL PRACTICE. The School is furnished with modern equipment, and the Clinic of the Hospital is unrivalled. Students may attend the operations in the In-Patient Department, and chair-side instruction is given in Advanced Operative Technique and Orthodontics.

DENTAL PROSTHETICS. The Mechanical Laboratory is a spacious and fully equipped department, under the direction of the Lecturer in Prosthetics.

HOUSE APPOINTMENTS. Six Senior House Surgeons and eighteen ordinary House Surgeons are appointed every year.

POST-GRADUATE INSTRUCTION. Instruction can be arranged in all branches of Dental Surgery.

Write for further particulars and School Calendar to THE DEAN.

LONDON FEVER HOSPITAL

FOUNDED 1802.

ISLINGTON, N.1.

The only Hospital of its kind in or around London which is NOT RATE SUPPORTED.

DISEASES TREATED are SCARLET FEVER, DIPHTHERIA, MEASLES and GERMAN MEASLES in the GENERAL WARDS, these and other INFECTIOUS DISEASES in PRIVATE ROOMS.

Governors are entitled to FREE Treatment in the Wards for themselves and Members of their households, and Contributing Firms for their Employees.

General Ward Fees—Children, 2 guineas; Adults, 3 guineas per week.
Private Rooms—7 and 10 guineas per week.

AMBULANCE sent on receipt of Telephone message (CLERKENWELL 9780).

Secretary - W. ELLIOT DIXON.

Central London

Throat, Nose, and Ear Hospital

GRAY'S INN ROAD, LONDON, W.C.1

(Close to King's Cross Stations).

OUT-PATIENT CLINICS are held daily, during which special attention is given to the instruction of Post-Graduate Students.

CLINICAL ASSISTANTSHIPS are tenable for periods of three, six or twelve months, and Clinical Assistants are expected to attend at least two clinics a week, when a table is reserved for them in the Out-Patient Department for the examination of patients. These appointments afford the best method of obtaining a satisfactory knowledge of the Speciality.

Arrangements can always be made to suit the individual requirements of those in general practice who may be unable to attend regularly.

WEEKLY LECTURES by members of Hon. Medical Staff—Fridays, 4 p.m.

COURSES IN METHODS OF EXAMINATION AND DIAGNOSIS are given at frequent intervals.

SPECIAL INTENSIVE COURSES OF LECTURES AND DEMONSTRATIONS are given twice yearly, in May and October. This course includes Operative Surgery, Anatomy and Physiology, Peroral Endoscopy, and Pathology and Bacteriology Classes, and is especially suitable for Students intending to take the Diploma in Laryngology and Otology of the Conjoint Examining Board (D.L.O., R.C.P. & S. Eng.). A full syllabus of the routine work and of the Intensive Courses may be obtained from the Dean or the Secretary-Superintendent.

University of St. Andrews

(SCOTLAND).

Chancellor—The Rt. Hon. STANLEY BALDWIN, M.P., P.C., LL.D.

Rector—The Most Hon. the MARCHESE MARCONI.

Vice-Chancellor and Principal—Sir JAMES COLQUHOUN IRVINE, C.B.E., D.Sc., LL.D., Sc.D., D.C.L., F.R.S.

FACULTY OF MEDICINE

(Dean—F. J. CHARTERIS, M.D.)

The University confers the following **DEGREES AND DIPLOMAS**—M.B., Ch.B., M.D., Ch.M., Ph.D., D.P.H., LL.D.S., D.P.D. (all open to men or women).

SESSION 1934-1935 opened 2nd October, 1934. The whole curriculum may be taken at Dundee, or the first two years may be taken in St. Andrews, the remaining three in Dundee.

CLINICAL INSTRUCTION at Dundee Royal Infirmary, and other Medical and Surgical Institutions in Dundee.

BURSARY (Scholarship) Competitions. June annually. Entries due 5th May.

RESIDENTIAL ENTRANCE SCHOLARSHIPS FOR MEN. Five or six of £100 competed for in June. Medical Students are eligible.

FEES for complete M.B., Ch.B. Course, exclusive of Examination Fees, Hospital Fees, etc., £182. Fees for LL.D.S., £88 10s.; Fee for D.P.D., £25.

PRELIMINARY EXAMINATION. September and March. Entries due 6th August and 6th February.

RESIDENCE HALLS for Men and Women at St. Andrews; for Women at Dundee. Provision made for **POST-GRADUATE STUDY AND RESEARCH.**

Full information may be obtained from the **SECRETARY OF THE UNIVERSITY**, 71 North Street, St. Andrews; or, the **DEAN OF THE FACULTY OF MEDICINE**, Westlands, St. Andrews.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL AND MIDWIFERY TRAINING SCHOOL MARYLEBONE ROAD, N.W.1

Consulting Obstetric Surgeons.

W. S. A. GRIFFITH, M.D., F.R.C.S., F.R.C.P. T. G. STEVENS, M.D., F.R.C.S., F.C.O.G.
T. W. EDEN, M.D., F.R.C.S., F.R.C.P., F.C.O.G. J. BRIGHT BANISTER, M.D., F.R.C.S., F.C.O.G.
A. P. STABB, M.B., M.R.C.S., F.R.C.P.

Consulting Physician: H. MORLEY FLETCHER, M.D., F.R.C.P.

Consulting Surgeon—Sir T. CRISP ENGLISH, K.C.M.G., M.B., B.S., F.R.C.S.

Obstetric Surgeons to In-Patients.

ALECK W. BOURNE, M.B., B.C., F.R.C.S., F.C.O.G. LEONARD G. PHILLIPS, M.S., M.B., F.R.C.S.
TREVOR B. DAVIES, M.D., B.S., F.R.C.S. C. S. LANE ROBERTS, M.S., M.B., F.R.C.S., M.C.O.G.
LOUIS C. RIVETT, M.A., M.C., F.R.C.S., M.C.O.G. LESLIE H. W. WILLIAMS, M.D., M.S., F.R.C.S., M.C.O.G.

Obstetric Surgeons to Out-Patients.

G. F. GIBBERD, M.B., B.S., F.R.C.S., M.C.O.G. A. C. H. BELL, M.B., B.S., F.R.C.S., M.C.O.G.

Physician.

C. McMORAN WILSON, M.C., M.D., F.R.C.P.

Assistant Physician.

T. C. HUNT, D.M. OXON., M.R.C.P.

Pædiatrician.

G. ERIC C. FRITCHARD, M.D., F.R.C.P.

Surgeon.

C. H. S. FRANKEU, C.B.E., D.S.O., M.B., F.R.C.S.

Ophthalmic Surgeon.

F. A. JULER, M.B., F.R.C.S.

Ear, Nose and Throat Surgeon.

J. P. MONKHOUSE, M.B., B.S., F.R.C.S.

Dental Surgeon.

J. D. CAMBROOK, M.R.C.S., L.R.C.P.

Medical Officers Ante-Natal Dept.

GERTRUDE DEARNLEY, M.D., F.C.O.G.

A. MORRIS JOHNS, M.D., CH.B.

DOUGLAS H. MACLEOD, M.D., M.S., F.R.C.S., M.C.O.G.

J. D. FLEW, M.D., M.C.O.G.

Medical Officer, Infant Consultation Centre.

A. A. MONCHIEFF, M.D., F.R.C.P.

Hon. Director of Research Laboratories

and Consulting Bacteriologist.

LEONARD COLEBROOK, M.B., B.S.

Qualified Practitioners and Students are admitted to the Practice of this Hospital. There are 50 Beds, and about 2,700 Patients are received annually. In addition to the valuable routine work of the Hospital and Ante-Natal and Child Welfare Departments, unusual opportunities are afforded of seeing Obstetrical Complications and Operative Midwifery, more than one-half of the total admissions being primiparous cases. There are 30 beds at the Isolation Block and Research Laboratories at Hammersmith for cases of puerperal fever and puerperal pyrexia. Clinical Demonstrations are given by the Staff daily. Certificates awarded as required by the various Examining Bodies. The Residential College for Students is opposite the Hospital (with which it is in telephonic communication).

For Rules, Fees, &c., apply to H. B. STOKES, Secretary-Supt.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL

(UNIVERSITY OF LONDON)

DENMARK HILL, LONDON, S.E.5.

THE NEW BUILDINGS of the Medical School were opened in July, 1933.

THE HALL OF RESIDENCE is near to the School.

THE ATHLETIC GROUND is within 10 minutes' walk of the Hospital.

FOURTEEN ENTRANCE SCHOLARSHIPS, total value of £1,530, are awarded annually.

DENTAL SCHOOL. A full Dental Course is given at King's Coll. Hospital and King's College.

The Calendar, Details of Scholarships, etc., will be sent on application to the DEAN,

J. A. DRAKE, M.D., F.R.C.P., D.P.H.; or to the Secretary, S. C. RANNER, M.A.,

King's College Hospital Medical School, Denmark Hill, London, S.E.5.

QUEEN MARY'S HOSPITAL FOR THE EAST END

(Founded 1861; Incorporated by Royal Charter, 1917).

STRATFORD, LONDON, E.15

Patron: HER MAJESTY THE QUEEN.

President: HIS ROYAL HIGHNESS THE DUKE OF GLOUCESTER, K.G.

Deputy President: Sir LEONARD LYLE, Bt., J.P. Chairman: T. MAY-SMITH, Esq., J.P.

Secretary: MAJOR RAPHAEL JACKSON.

THE POOREST OF THE POOR are treated at this Hospital. Normal Accommodation. 219 Beds. Cost of Endowing a Bed, £1000; a Cot, £500. Funds most urgently needed to meet current expenditure, and will be gratefully received by CLAUD F. GODDARD, Esq., Hon. Treasurer, 22 King Street, S.W.1, or by the Secretary.

In-Patients treated, 1933	..	3,703	Out-Patient Attendances, 1933	..	144,156
Accidents treated, 1933	..	16,545	Ordinary Expenditure, 1933	..	£46,828
Income from Annual Subscriptions and Invested Property			..	£5002	

RAPHAEL JACKSON (Major), Secretary.

UNIVERSITY of BRISTOL

FACULTY OF MEDICINE

THE University affords complete courses of instruction for the examinations for its own Medical and Dental Degrees and Diplomas except the D.P.H., and, when vacancies permit, for the examinations of other bodies.

The University confers the following Degrees and Diplomas :

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY	M.B., Ch.B.
MASTER OF SURGERY	Ch.M.
DOCTOR OF MEDICINE	M.D.
DOCTOR OF PHILOSOPHY	Ph.D.
BACHELOR OF DENTAL SURGERY	B.D.S.
MASTER OF DENTAL SURGERY	M.D.S.
DIPLOMA IN DENTAL SURGERY	L.D.S.
DIPLOMA IN PUBLIC HEALTH	D.P.H.

The early part of the curriculum so interlocks with the curriculum for the B.Sc. degree that the taking of this degree in addition to the M.B., Ch.B. is facilitated. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by the Lecturer in Dental Mechanics and a staff of skilled mechanics.

CLINICAL WORK is done at the Bristol Royal Infirmary and the Bristol General Hospital, which together contain 668 beds. The Bristol Royal Hospital for Sick Children and Women (120 beds), the Bristol Eye Hospital, the Bristol City and County Asylum, the Bristol City Fever Hospital and, by the kind permission of the Health Committee of the Bristol City Council, Southmead Hospital are also open for the clinical instruction of students.

SCHOLARSHIPS.—There are Henry Herbert Wills Science Scholarships, and a Miriam Badock Entrance Scholarship, available to boys from Clifton College, which may be held in the Faculty of Medicine. Students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the Director of Education, Guildhall, Bristol. Forms of application must be returned to him by April 30th.

Several Scholarships and Prizes are open to students during their Hospital career.

HOSPITAL APPOINTMENTS, open to students after qualification :—

At the Bristol Royal Infirmary.—Four House Surgeons, one Casualty House Surgeon, two House Physicians, one House Physician for Cancer Research Wards, one Resident Obstetric Officer, one Ophthalmic and Gynaecological House Surgeon; one Ear, Nose and Throat House Surgeon; one Assistant to the Senior Resident Medical Officer, who also acts as House Surgeon, and House Surgeon to the Skin Department; and one Dental House Surgeon.

At the Bristol General Hospital.—Senior Resident Medical Officer; one Casualty House Surgeon; two House Physicians; two House Surgeons; one Resident Obstetric Officer; one House Surgeon for Special Departments; one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the DEAN of the Faculty of Medicine.

City of London Maternity Hospital and Midwifery Training School. CITY ROAD, E.C.1

Consulting Physician: R. A. YOUNG, Esq., C.B.E., M.D. (Lond.), F.R.C.P.

Consulting Surgeons: { SIR HUGH M. RIGBY, K.C.V.O., M.S. (Lond.), F.R.C.S.
R. J. McNEILL LOVE, Esq., F.R.C.S. (Eng.).

Consulting Obstet. Surgeons: { SIR COMYNS BERKELEY, M.C., M.A., M.D., F.R.C.P.
EARDLEY HOLLAND, Esq., M.D. (Lond.), F.R.C.P., F.R.C.S., F.C.O.G.

Obstetric Surgeons:
W. McKIM H. McCULLAGH, Esq.,
D.S.O., M.C., B.A., M.B., B.Ch. (Belfast),
F.R.C.S., M.C.O.G.
ARNOLD L. WALKER, Esq., M.A., M.B.,
B.Ch. (Camb.), F.R.C.S., M.C.O.G., L.R.C.P.
R. CHRISTIE BROWN, Esq., M.S. (Durh.),
F.R.C.S., M.C.O.G.

Assistant Obstetric Surgeons:
R. L. DODDS, Esq., M.B., M.Ch.,
F.R.C.S. (Eng.).
J. V. O'SULLIVAN, Esq., M.D., M.R.C.P.
(Lond.), F.R.C.S. (Eng.), M.C.O.G.
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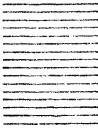
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
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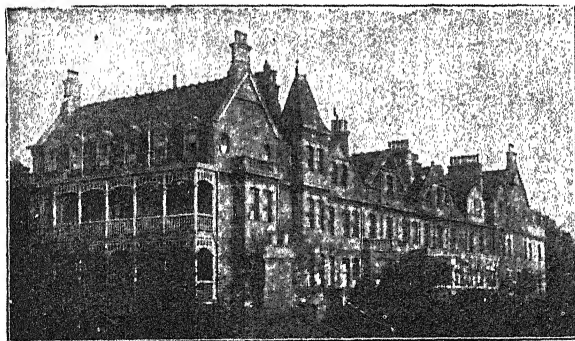
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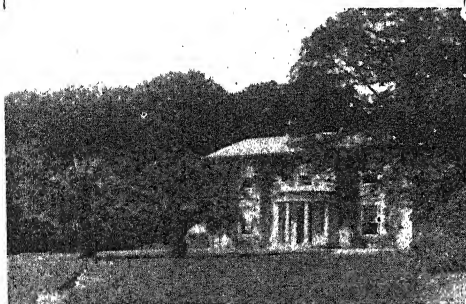
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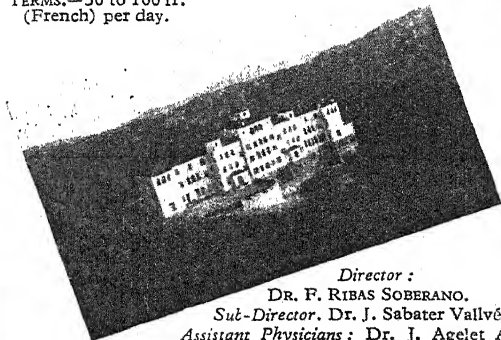
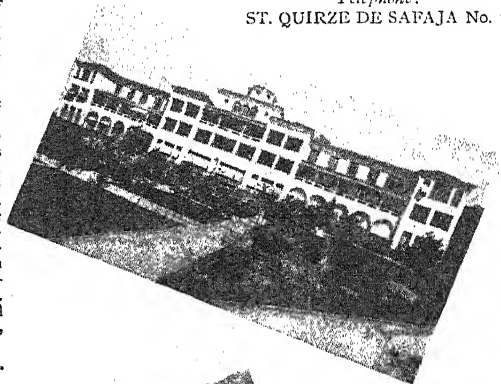
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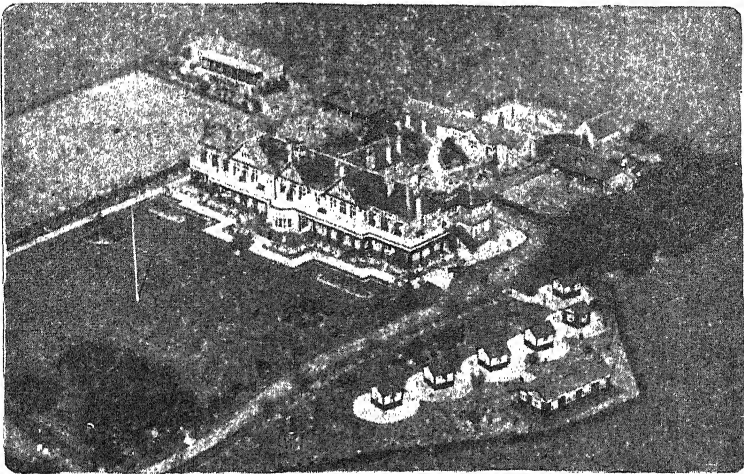
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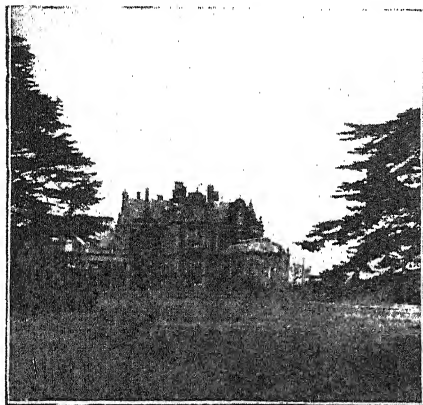
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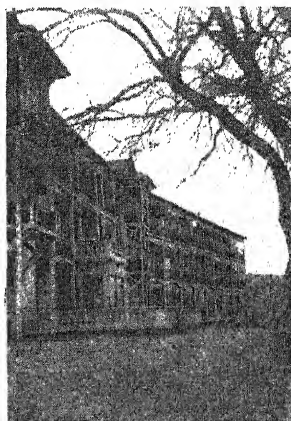
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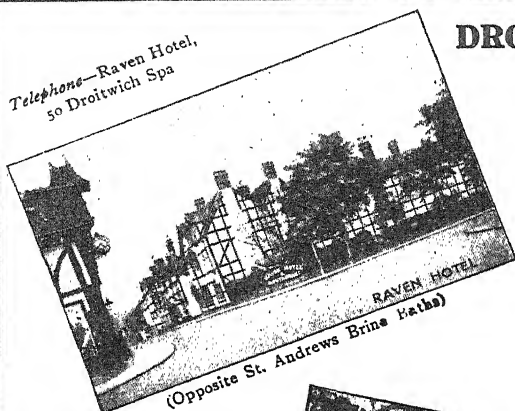
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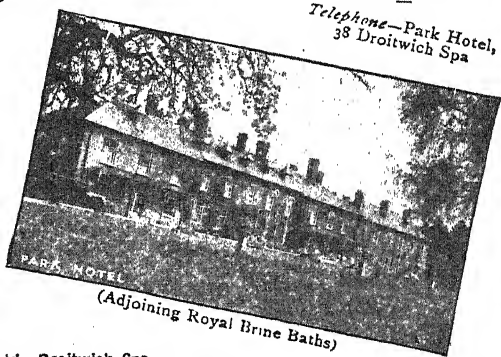
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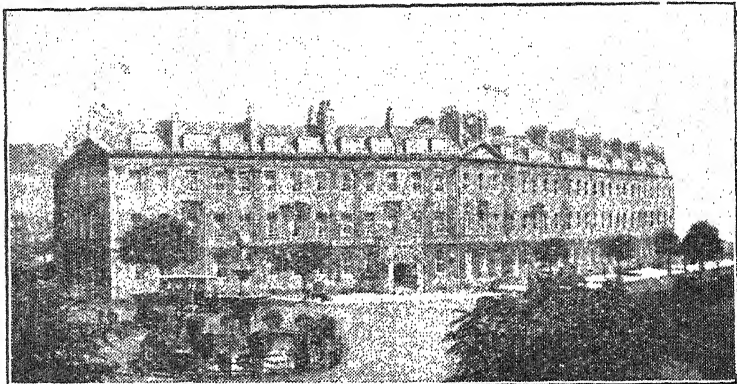
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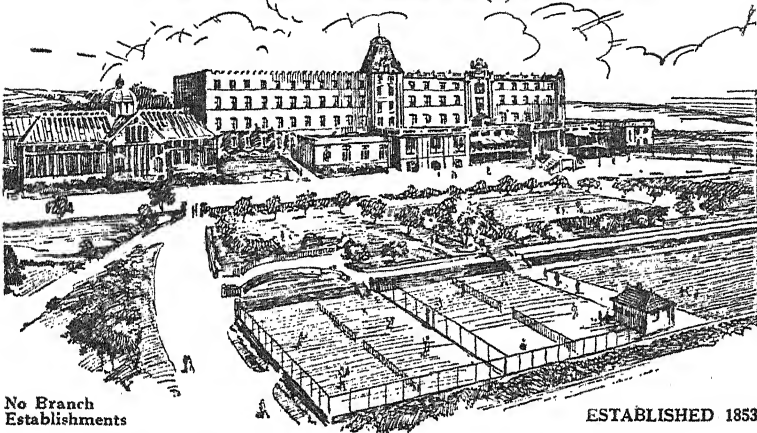
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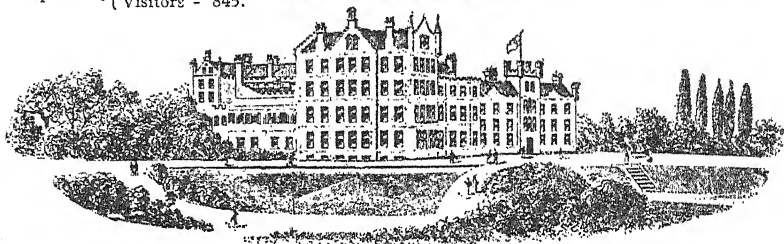
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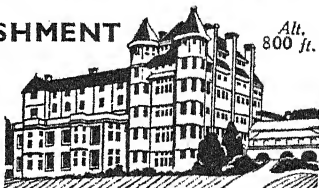
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There are branch establishments situated at St. Edmondsbury, Lucan, within a beautifully wooded demesne of about 400 acres. A portion of the demesne is worked as a home farm, from which daily supplies of milk, mutton, poultry and vegetables, etc., are delivered to the three hospitals by means of a motor van. Extensive gardens and recreation grounds. Frequent drives by motor.

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Medical Superintendent	-	RICHARD R. LEEPER, F.R.C.S.I.
Assistant	-	{ ROBERT THOMPSON, M.B., D.P.M.
Medical Officers	-	{ ROBERT TAYLOR, L.R.C.P. and S.I., D.P.M.
	-	{ FRANCIS J. McLAUGHLIN, L.R.C.P. & S.I.
Clinical Pathologist	-	ROBERT H. MICKS, M.D., F.R.C.P.I.
Dentist	-	ALBERT F. CARBURY, L.D.S.I.

Rates of maintenance vary according to the nature of each case and the accommodation required.

For forms and further particulars apply to Mr. A. E. Coe, Registrar, St. Patrick's Hospital, James Street, Dublin; or, in case of urgency, to the Medical Superintendent.

Telephones : Dublin 21095. Lucan 21.

BETHEL HOSPITAL

For Mental and Nervous Disorders,
NORWICH.

ESTABLISHED A.D. 1713.

THIS Institution is a Registered Hospital, managed by a Board of Governors, who have no pecuniary interest in its success, but whose sole object is to promote the comfort and well-being of the Patients. The Hospital is arranged for both sexes.

Voluntary Patients are admitted without certificates.

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RESIDENT MEDICAL SUPERINTENDENT:

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APPLICATION FOR ADMISSION TO BE MADE TO THE
Resident Medical Superintendent - BETHEL HOSPITAL, NORWICH.

THE COPPICE,

NOTTINGHAM.

Hospital for Mental Diseases.

THIS Institution for the reception of PRIVATE PATIENTS of both sexes of the Upper and Middle Classes only, at moderate rates of payment, is beautifully situated in its own grounds about two miles from Nottingham, and from its singularly healthy and pleasant position, and the comfort of its internal arrangements, affords every facility for the Relief and Cure of those Mentally Afflicted. Divine Service is held in the Institution every Sunday by the Chaplain, who also visits the Patients. Carriage and motor exercise is provided.

Voluntary and Temporary Patients admitted.

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64117.

FOR TERMS, ETC., APPLY TO ———
DR. HUNTER. Physician-Superintendent.

HAYDOCK LODGE

NEWTON-LE-WILLOWS, LANCASHIRE

Telegraphic Address: "STREET, ASHTON-IN-MAKERFIELD" (two words only)

Telephone: ASHTON-IN-MAKERFIELD 7311

A PRIVATE MENTAL HOSPITAL FOR THE TREATMENT OF NERVOUS & MENTAL DISORDERS EITHER TEMPORARILY, VOLUNTARILY OR UNDER CERTIFICATE

HAYDOCK LODGE is a large Country Mansion especially adapted for the Care and Treatment of Persons with Nervous and Mental Disorders, having been enlarged and rebuilt on plans sanctioned and approved by the Commissioners in Lunacy. It is charmingly situated in a healthy and retired neighbourhood, standing in its own well-timbered Park, Gardens, and Farm of 300 acres, with provision and facilities for Tennis, Cricket, Football, Bowls, Croquet and Golf.

Newton-le-Willows is a first-class station on the L. M. & S. Rly. (mid-way between Liverpool and Manchester), where conveyances are always to be had.

Motors are kept for the use of Patients, and those whose condition will allow, and whose friends desire it, spend some time annually at the sea-side. Voluntary Patients are received without Certificate, written application for admittance being all that is required. Patients are also admitted on a Temporary basis.

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TERMS, PROSPECTUS and INFORMATION may be obtained on application to the Medical Superintendent.

Consultations can be arranged by appointment.

Resident Medical Licensee..... } J. C. WOOTTON, L.R.C.P.Lond., M.R.C.S.Eng.
Medical Superintendent..... }

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Telephone 51

A PRIVATE HOSPITAL FOR THE CARE AND TREATMENT OF THOSE OF BOTH SEXES SUFFERING FROM MENTAL DISORDERS.

Extensive grounds. Detached Villas. Chapel. Garden
and dairy produce from own farm. Terms very moderate.

Convalescent Home at Bournemouth

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Courts, etc. Patients or Boarders may visit the above, by
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Illustrated Brochure on application to the Med. Supt., The Old Manor, Ltd., Salisbury.

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A LIMITED number of **LADIES** suffering from **MENTAL** and **NERVOUS DISORDERS** are received for treatment under a Specialist. The House stands in large grounds.

Telephone: Tulse Hill 4913.

For further particulars see *Illustrated Prospectus from Resident Licensee*: Miss THWAITES.

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*A Registered Hospital for the
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of the EDUCATED CLASSES.*

THIS Institution is situated in a beautiful and healthy locality within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Patients can be admitted.

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Telephone :
Norwich 80.

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ABOUT two and a half hours from London by express train, L.N.E.R., and in connection with the Midlands by Midland and Great Northern Joint Line.

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Seaside quarters are available when desired, and all amusements conducive to recovery are provided.

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A Registered Hospital for the Care & Treatment of both Sexes of the Upper and Middle Classes, when suffering from Nervous and Mental Disorders. . .

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Vice-Chairman—

D. S. MARGOLIOUTH, Esq., D.Litt., F.B.A., Fellow of New College.

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The buildings are arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

TEMPORARY PATIENTS AND VOLUNTARY PATIENTS ARE RECEIVED.

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Telephone—

Physician Superintendent, ALEX. W. NEILL, M.D. 2063 OXFORD.

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CHEADLE, CHESHIRE.

A Registered Hospital for MENTAL DISEASES, and its Seaside Branch, GLAN-Y-DON, Colwyn Bay, N. Wales.

THE object of this Hospital is to provide the most efficient means for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL and NERVOUS DISEASES. The Hospital is governed by a Committee appointed by the Trustees of the Manchester Royal Infirmary.

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For Terms and further information apply to the MEDICAL SUPERINTENDENT.

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Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.,
Consulting Physician for Mental Diseases to the Sheffield Royal Hospital.

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham) and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Certified Voluntary and Temporary Patients received. The Rev. R. T. C. Slade, Mus. Bac., late Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

The Resident Physician may be seen at the Grange; or at 342 Glossop Road, Sheffield, by appointment. Telephone: Sheffield No. 40030.

GRANGE LANE STATION (L. & N.E. Railway) is within a quarter of a mile of the Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham, changing at Tinsley.

FOR TERMS, FORMS, &c., APPLY TO THE RESIDENT PHYSICIAN.

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Telephone: No. 8 FORMBY.

Near LIVERPOOL.

THIS HOUSE, specially built and licensed for the Care and Treatment of a limited number of LADIES and GENTLEMEN suffering from
MENTAL or NERVOUS BREAKDOWN,

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TERMS MODERATE.

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Telephone :
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The terms are moderate, being from 3 gns. per week upwards.

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for Ladies and
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Consulting Rooms: 57 GROSVENOR STREET, W.1. (By Appointment).

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Under the management of a Committee of the Corporation of the City of London.

LADIES and GENTLEMEN received for treatment under Certificates and without Certification, as either Voluntary or Temporary Patients, at a WEEKLY FEE of TWO GUINEAS and upwards. An Illustrated Booklet giving full particulars can be obtained from the Medical Superintendent.

The Institution is within two miles of Dartford Station, on the Southern Railway, with frequent electric train service, and is about 16 miles from London. Trams and Motor Omnibuses pass the door.

Telephone: DARTFORD 900, 901.

Telegraphic Address: STONE HOUSE, DARTFORD KENT.

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An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.

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TERMS vary according to requirements as to accommodation, special attendance, etc.

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IDEALLY situated within two miles of the City and in a health-inducing district. Voluntary boarders received without medical certificates.

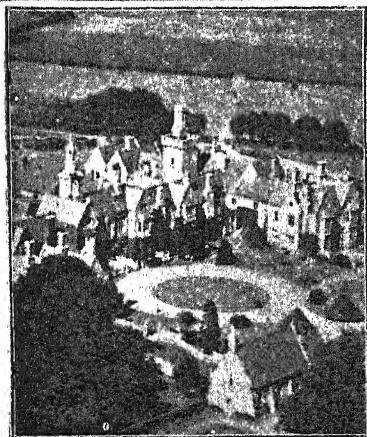
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Experienced staff; modern treatment. Interviews can be arranged at 42, FITZWILLIAM PLACE, DUBLIN.

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*PHONE: FINGLAS 11.

Medical Superintendent.



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Mental Hospital

Near STAFFORD.

Chairman of the Committee of Management :
THE RIGHT HONOURABLE
THE EARL OF DARTMOUTH.

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Telephone: Stafford 14.

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Near BEDFORD

Telephone No. 3417

For Mental Cases, with or without Certificates

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(including Separate Bedrooms for all suitable Cases, without extra charge). :: ::

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(TWENTY MILES FROM LONDON)

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Apply to MEDICAL SUPERINTENDENT.

'Phone 10 P.O. Church Stretton.

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Special accommodation for **LADY VOLUNTARY PATIENTS** is also provided at the **MANOR HOUSE**, which has its own private grounds and is entirely separate from the main Hospital.

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Telephone No. 6207 BARNWOOD. *Resident Superintendent.*

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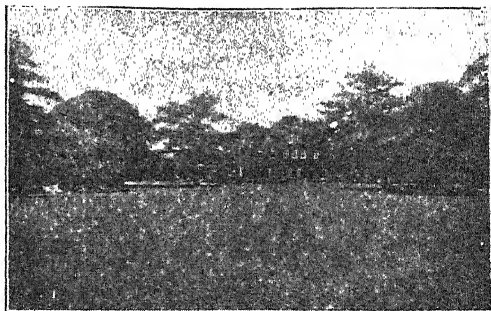
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The above Hospital, situated in healthy country, three miles from Exeter, **RECEIVES PRIVATE PATIENTS OF BOTH SEXES.**

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Special Attention is given to the Curative Treatment of Early Cases, also to Fresh-Air Treatment & Occupational Therapy.

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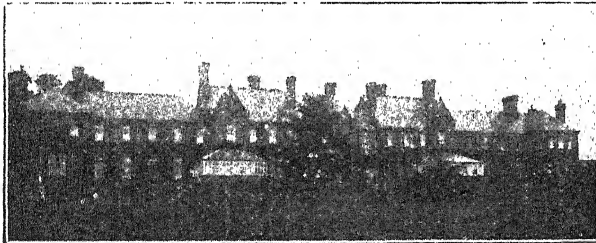
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suffering from Nervous
and Mental Disorders.**

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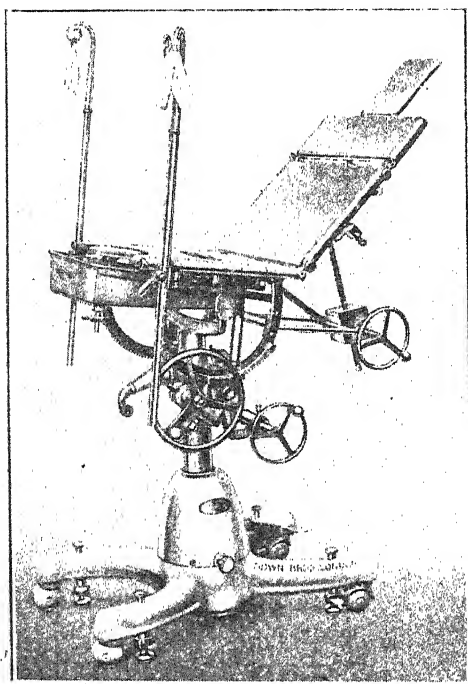
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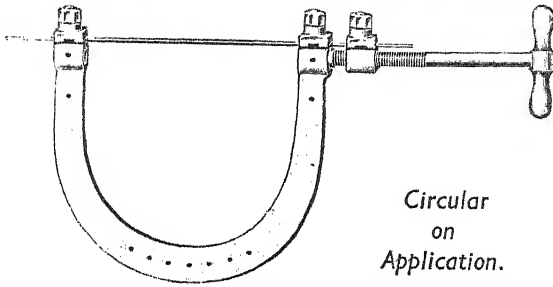
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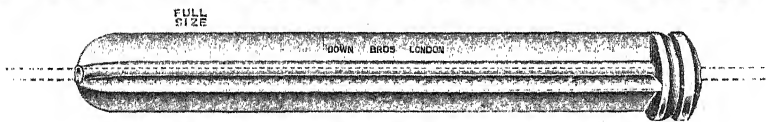
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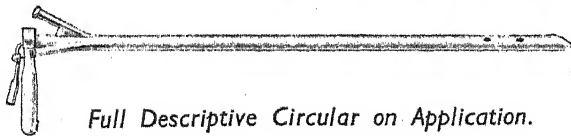


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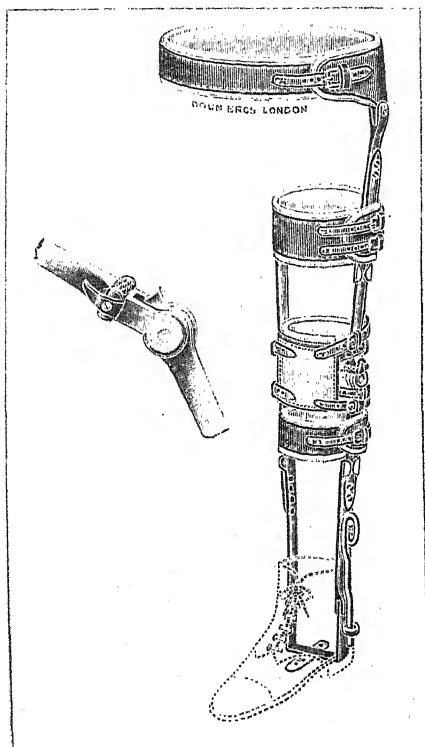
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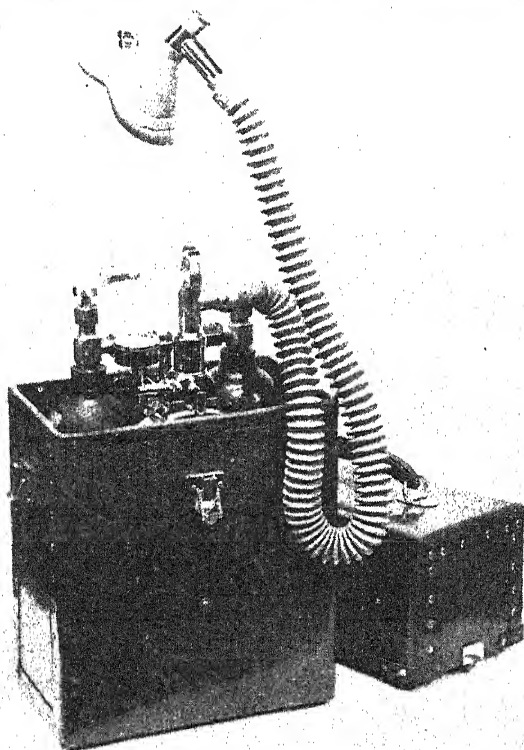
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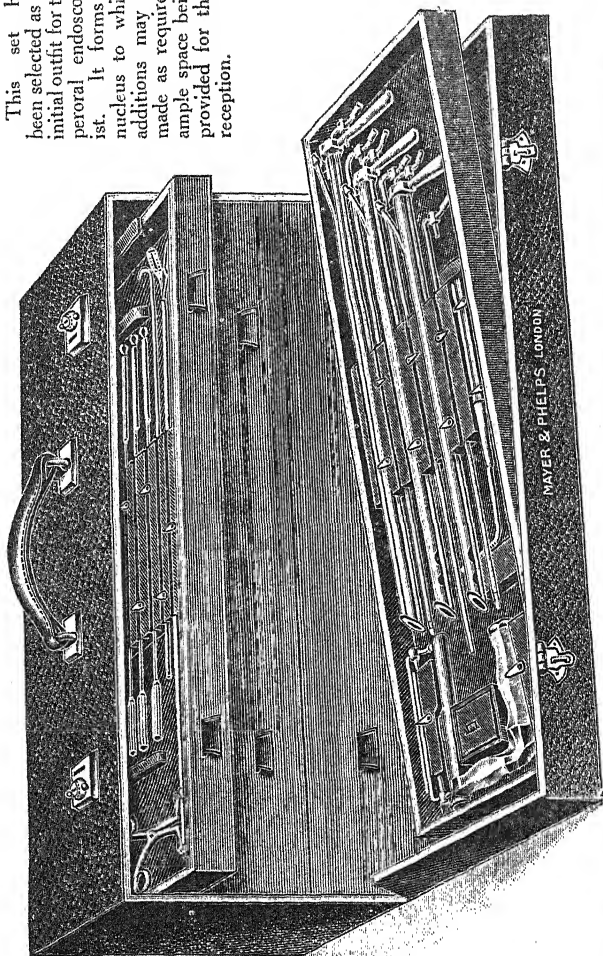
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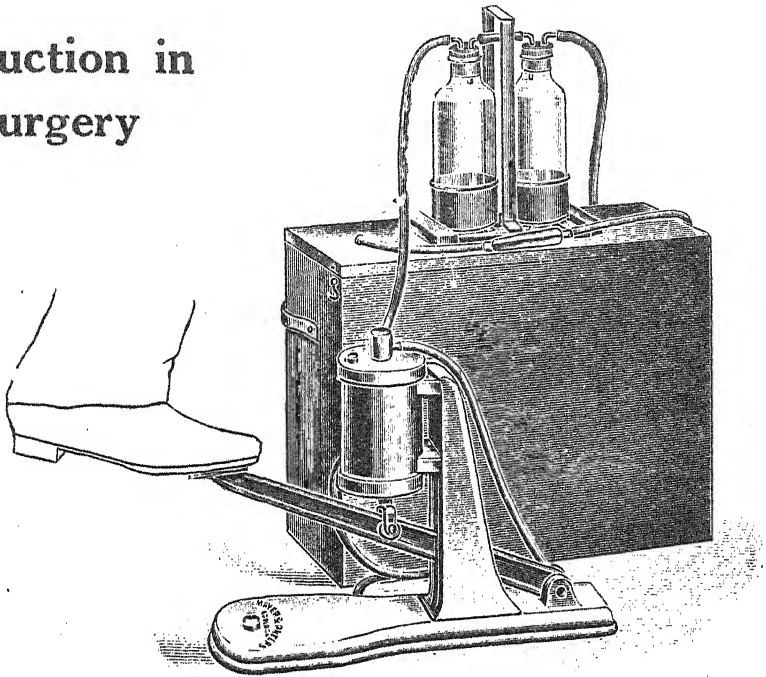
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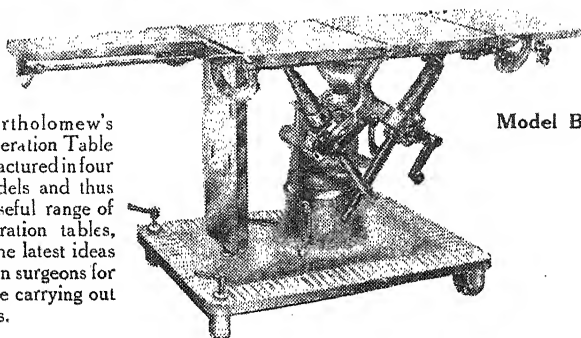
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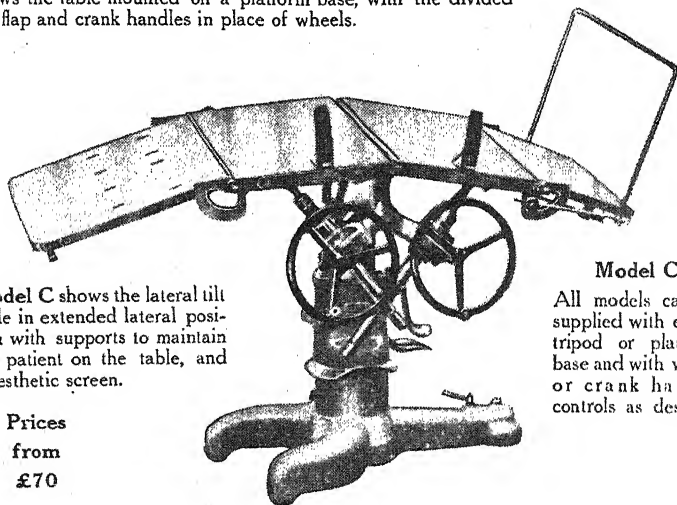
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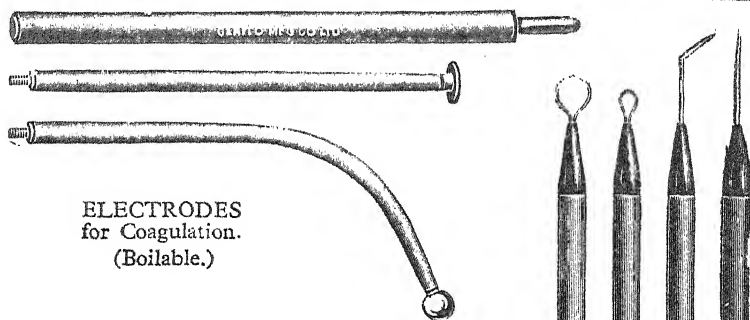
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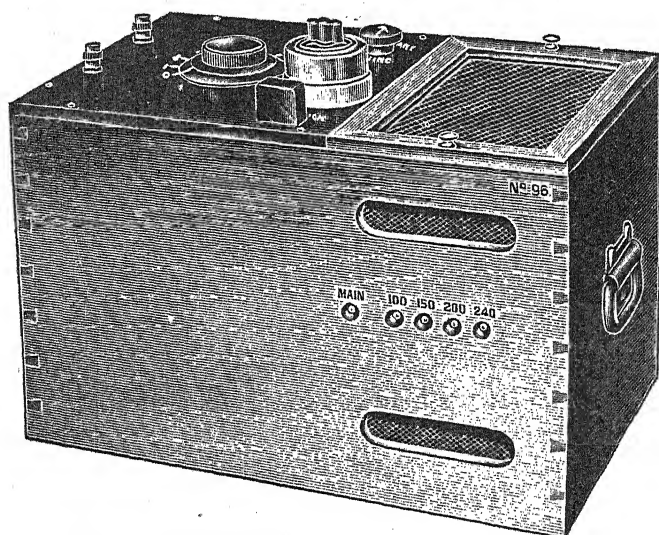
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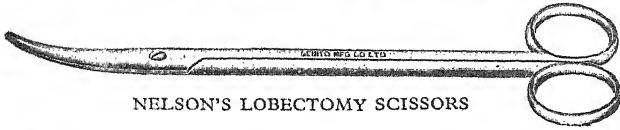
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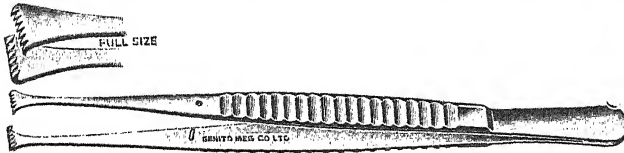
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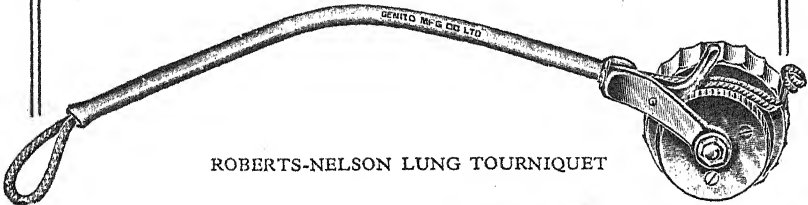
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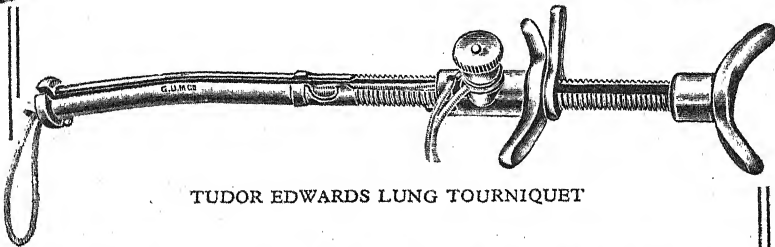
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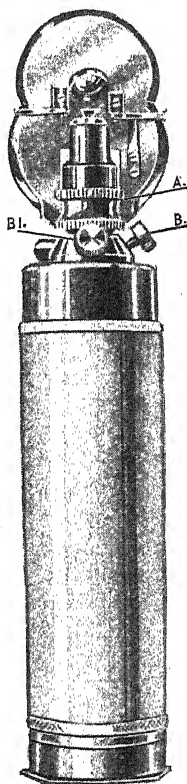
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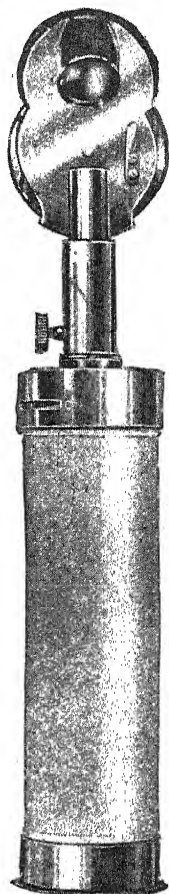
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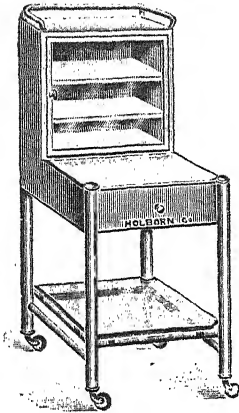
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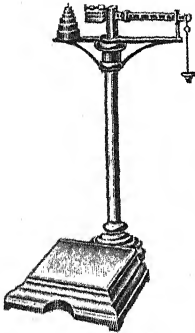
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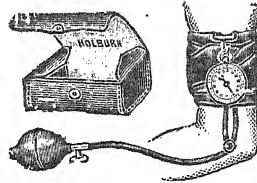


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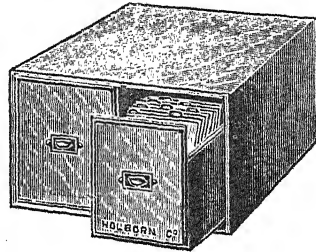
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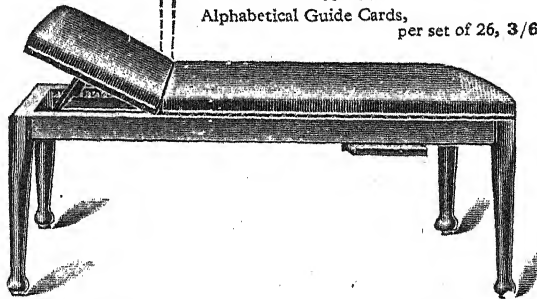
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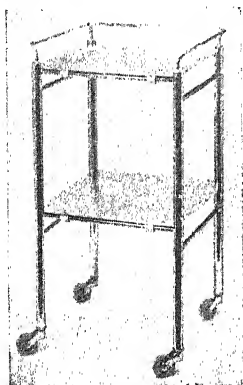


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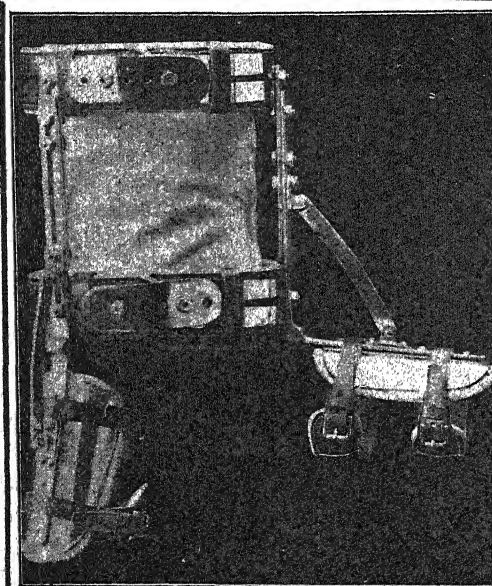
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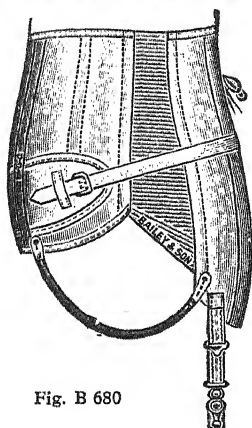


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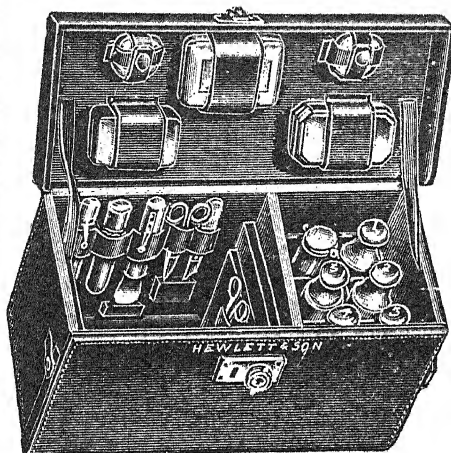
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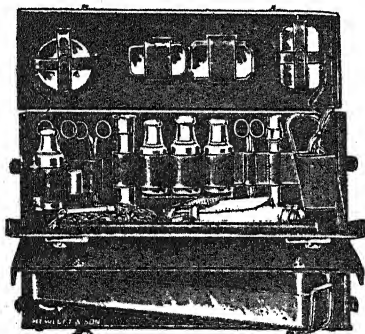
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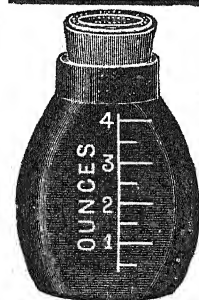
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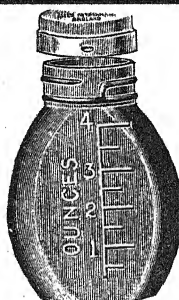
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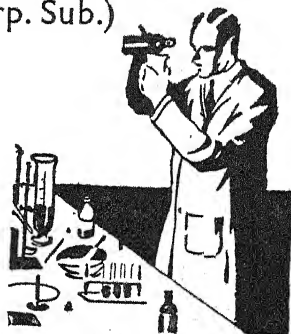
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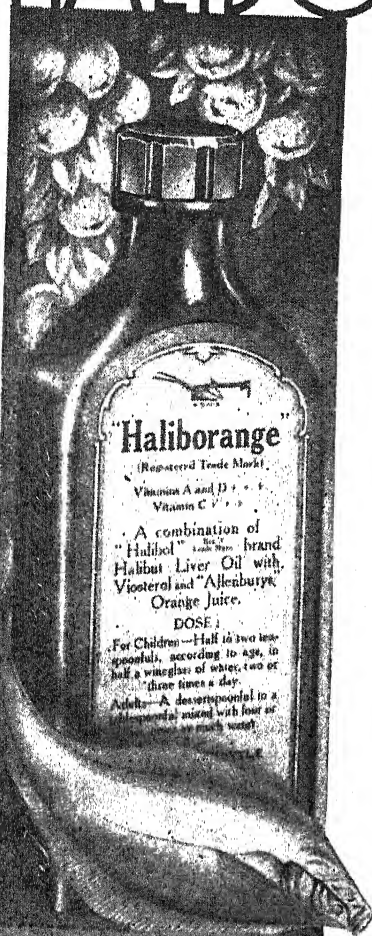
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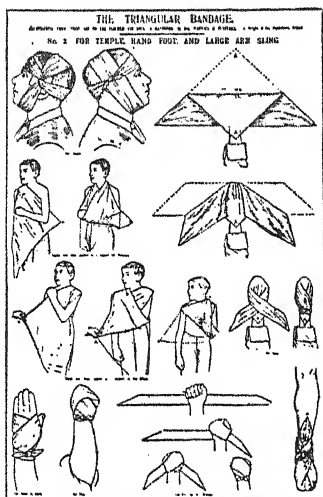
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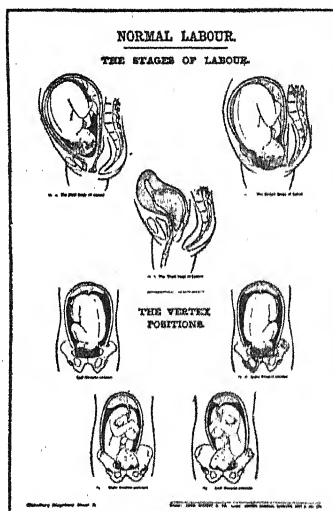
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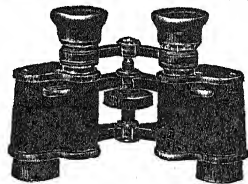


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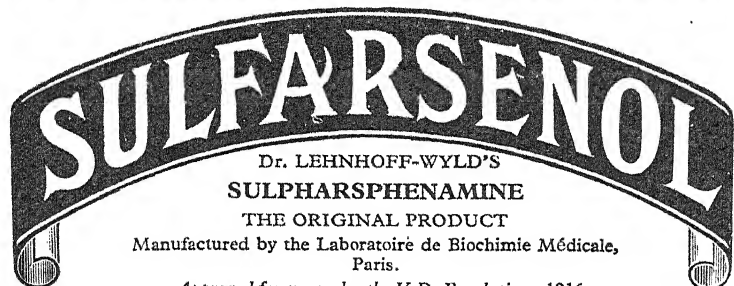
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